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Latest Advances in Nutrition[1]

CHARLES GLEN KING, Ph.D., D.Sc.

Executive Director,
The Nutrition Foundation, Inc.,
New York, New York

THE VALUE of dietetics as a profession and the services of The American Dietetic Association become doubly clear when one examines the situation in countries where there is no comparable group to serve the respective communities. This relationship is particularly true with respect to hospitals, schools, restaurants, hotels, camps, and food processors.

You can also continue to make a great contribution to the crucial task of educating the public. The slogan, "Better Meals Build Better Families," has been a good starting point. To gain substantial progress, however, there must be constant and consistent follow-up of demonstrations, artistry, understanding, enjoyment, convenience, and appropriate costs. The Nutrition Foundation will be glad to cooperate wholeheartedly with you in your professional and lay educational programs. The enthusiastic press acceptance of special newspaper columns on nutrition by Dr. Fredrick J. Stare, Harvard School of Public Health, and by Gaynor Maddox of the Newspaper Enterprise Association seems to augur well for increased education that is sensible, accurate, and popular.

The science of nutrition is mature enough now to furnish reliable guide lines both for the public and for the health professions. The steady progress of research and the changes in food patterns from year to year are so substantial, however, that the need for education is continuous.

Chromium—An Essential Nutrient

Among recent advances that are relatively fundamental, the demonstration that chromium is essential in animal nutrition (1-5), is not surprising. It is intriguing. This is the eighth successive element to fit the pattern of discovery as an essential nutrient after several decades of biologic study that had been undertaken originally because in high concentration it had been dangerous in causing injury. The list in review is starkly impressive: chromium, selenium, molybdenum, cobalt, fluorine, manganese, zinc, and copper. The first two could readily be tagged as carcinogens, or cancer formers, in the sense of a layman's discussion (6).

Yet we cannot take lightly the basic importance of these micronutrients. Chromium is already associated with the body's utilization of sugars; selenium, zinc, and manganese function in the control of proteins; molybdenum is active in deriving energy from fats, and cobalt is necessary to protect the functions of nerve cells and red blood cells. On the romantic side of life for trout fishermen, molybdenum has been shown also to be a limiting nutrient for the growth of a food supply for trout in some of California's mountain lakes.

In a practical sense, the micro-elements are characteristic of foods derived from plants, almost as regularly as from animal sources. The leafy foods, cereals, fruits, legumes, lean meats, and sea foods furnish them in relative abundance and in balanced proportions.

Experiences during the past few years, including 1960, show how urgent the need is for the public as well as scientists to understand the concept that *all nutrients are only safe or useful to the body within a limited quantitative range* (7). Practically every bite of normal, fresh plant or animal food that we eat has in it at least some quantity of all the nutrients that our bodies need, plus many others that are useful but not necessary, and still others that, so far as we know, are not useful but may or may not be harmful. Whether or not they are useful or essential, they are *all* harmful if consumed in excessive quantities (just as salt or copper would be) and harmless when consumed in sufficiently small quantities (just as selenium, fluorides, and chromium would be).

Need for Education of Laymen

This point of view is relatively simple for a chemist or biologist to understand, but society has reached a point where congressmen and laymen need to understand it, too. Otherwise, ill-informed and vitu-

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 19, 1960.

perative laymen will increasingly mislead or frighten members of government, and thus cause laws to be established that are detrimental to society and unsound in the light of reason and judgment (8). Hence attempts to regulate the content of foods on a basis of absolute zero concentration instead of on the basis of protection of health and reasonable tolerances for upper and lower ranges of concentration, represent a growing hazard both to scientific progress and to our future social structure. That approach is not good biologically, and in a chemical sense, it is unsound because the basis for evaluation may change with each new issue of a journal that gives a more accurate or more sensitive method of analysis. The balancing functions between efficient food supplies and population trends are inescapable, as brought out clearly in the recent symposium on "World Food Needs and Food Resources" at the Fifth International Congress on Nutrition (9). Continued propaganda against the uniform distribution of iodized salt and fluoridation of water supplies, in addition to the pressure for zero tolerances in milk, meat, and other food commodities, are prime examples of misunderstanding and trends against the public interest.

Obesity

A corequisite to insistence on regulation by reasonable tolerances instead of absolute prohibitions is to be intensely alert regarding potential risks to health. These may be introduced in surprising ways by the use of new products, new processes, new environments, or continued use of old methods and products that have not been adequately tested. Strict adherence to these reasonable precautions is both possible and desirable—welcomed alike by the public and by industry.

Another area of interest is with reference to fats. These problems fortunately include a scale of values that can be expressed in pounds. There is also an expanding body of "fatual" information.

The evidence increases steadily to indicate that excess body fat is unfavorable to health in terms of heart disease, cerebral strokes, diabetes, kidney failure, liver diseases, risks of surgery, shortened life span, and many other respects. The earlier in life the trend of overweight begins, the more difficult it is to correct the food pattern or repair the injury. A part of the problem is genetic and structural, but this factor does not offset the fundamental requirement to balance the total caloric intake with the day-to-day total expenditure of energy. To be sure, there are recurrent waves of new fads, fakes, and fancies, such as vibrators, massage, or drugs to burn off or relocate the surplus fat so that "the lady will be beautiful." Nevertheless, I believe much real progress is being made in the direction of educating professional groups and the public.

A good starting point is to realize that the average adult body weight in the United States has been about 15 lb. above the ideal for best health. This point needs repetition. Those who sell food, as well as those who enjoy a good meal, stand to gain more both economically and in the pleasures of living, when the consumer is smart enough to avoid being overweight—in other words, not to indulge in our most damaging kind of *mal*nutrition.

The evidence is fairly clear that poor genetic records, overweight, high blood pressure, sustained high blood cholesterol values, excessive smoking, and high or low extremes of exercise are unfavorable health indicators. Although none of these tests alone are satisfactory as a specific indicator of approaching breaks in health, they take on increased predictive value when two or more point in the same direction.

Atherosclerosis

Several dietary stresses that tend to induce atherosclerosis in experimental animals when deficiencies are severe have been explored without getting substantial evidence that they are of major importance in the human situation—namely, low intakes of vitamin B_6, choline, or protein. These factors cannot be eliminated from consideration, but there is still no strong evidence that they are of major importance in the origin or acceleration of atherosclerosis (7).

Magnesium intakes are of increasing interest, especially when the calcium or phosphate intakes are high. Dr. Bert Vallee's group has shown in 1960, for example, that magnesium deficiencies are occasionally severe enough to give rise to clinically recognized tetany. They commented on the risk that such occurrences are apt to be mistaken for calcium deficiencies. This whole area of calcium-magnesium-phosphate ratios merits intensive research and practical consideration in human diets (10-12), including the relationship to dental caries (13). Among special points of interest, there is need for an appraisal of the role of calcium-magnesium balances in relation both to hypercalcification of soft tissues and to blood clot regulation. This kind of exploration is needed as a supplement to further studies of potassium-sodium balances that affect blood pressure and hormone balances within the kidneys, adrenal cortex, and the pituitary.

The nutritional importance of linoleic acid has advanced steadily. Both in adult nutrition and in infant feeding, the studies of blood lipid regulation have indicated a need to furnish an adequate source of linoleic acid or its equivalent. In fish body fat, for example, other acids with a similar structure apparently can serve quite as well as linoleic acid (14-18). In animals, at least, such acids exert a favorable effect in relation to atherosclerosis and

blood cholesterol. In the human situation, there are indications, also, of its having a comparable role, but the evidence on this score is not yet convincing to many leading research scientists working on the problem (7).

Among the questions under most intense study at present are:

(a) How significant are the known changes in blood lipids as an index of atherosclerosis or risks of uncontrolled clot formation?

(b) What quantity of linoleic acid or its equivalent is needed to accomplish optimum health protection?

(c) In what degree are changes induced by low intakes of linoleic acid reversible or preventable by a lower intake of total calories or by more exercise?

(d) Are there other tests that would give a better index of health risks than the conventional measures, for example, of serum cholesterol or total serum lipids?

Enough headway has been made to indicate that moderate intakes of animal fats do not impose a risk to health in normal persons when the diet as a whole is well balanced, including linoleic acid or its equivalent. Much work is under way to establish the desirable intake of specific kinds of fat under a wide range of environments and dietary practices. As adequate information becomes available, however, the public and the food industry should have no great difficulty in meeting the problem in terms of common foods.

Ascorbic Acid and Bioflavonoids

At the New York Academy of Science's recent Conference on Vitamin C, Professor B. C. Guha of Calcutta University gave a very interesting paper. He had tested the livers and kidneys in a large series of animals, in measuring the specific enzyme L-gulonolactone oxidase) that permits nearly all animals except primates and guinea pigs to make their own supply of ascorbic acid from glucose. One fruit-eating species of bat and one kind of fruit-eating bird (bulbul) were discovered to lack the enzyme, and hence were subject to scurvy. His discovery doubles the number of animal types with this specific genetic limitation (19).

Two other speakers at this conference, R. E. Lee (19, 20) of Cornell University and J. Fabianek (19) of Paris, reported extensive investigations showing that the bioflavonoids, often represented as having substantial merit in preventing hemorrhages associated with scurvy and other vitamin-like qualities, do not have any such value, as claimed in advertising and in other sales promotion literature.

In the field of protein research, one of the brightest spots is in finding how well protein foods based on cereals and legumes can be used in child feeding. In areas of the world where milk, meat, fish, and poultry products are unavailable and cannot be made available promptly, low cost, carefully tested blends of legumes, cereals, and yeast, such as the product developed by Scrimshaw in Guatemala (Incaparina), offer great promise (9). When one returns homeward from visiting areas where protein deficiencies are severe, our difficulties seem less formidable, and our sense of values in the science of nutrition cannot escape being deepened and broadened.

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BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Frances Stern—July 4, 1873–December 23, 1947

Nutrition research findings should be made to function in the daily lives of people. This means that there must be interpretation in terms of food and meal plans, adapted to the social and economic conditions of individuals and families. The Frances Stern Food Clinic, the first of its kind in the world, was founded on this principle and grew under the leadership of the great nutrition interpreter for whom it was named.

Frances Stern, youngest child of a large family, was born July 4, 1873, in Boston, which was the center of her life's work. When she was sixteen she started teaching English to immigrants and religious subjects to their children. A few years later she was one of the organizers of the Louisa May Alcott Club to teach nutrition and homemaking to young girls. Miss Stern's story is that of one who had vision and ability to grow with the times. She saw the needs in child health education and the steps necessary to provide for those needs. Few teaching materials were available, and the term, "visual aids," had not yet been coined. Frances Stern realized that she must make her own materials and that they must be simple, instructive, and visual—stories without words and pictures that could be understood in any language and adapted to the needs of the group and their age and background. This was a procedure to be adopted later so effectively in her clinic teaching of nutrition and ultimately in her book *Diabetic Care in Pictures* (co-authored with Helen Rosenthal and Dr. Joseph Rosenthal).

Effective work with children necessitated a knowledge of their homes and background. This led to work with mothers and then to a study of working conditions of fathers in industry.

To further her own knowledge of nutrition, Miss Stern became a special student at Massachusetts Institute of Technology under Sedgwick and Ellen H. Richards, for whom she was secretary and assistant. At this time, it became necessary for Miss Stern to earn her living and make a home for an invalid brother. She was appointed Instructor Visiting Housekeeper for the Boston Tuberculosis Association and later, Industrial Health Inspector for the Massachusetts State Board of Labor and Industry.

Dr. Michael M. Davis, Director of the Boston Dispensary, saw the need of good nutrition as part of the medical treatment of wage earners and their families and with his approval, Frances Stern started a Food Clinic in the Dispensary in April 1918. This work was interrupted by service with the Red Cross in France, and she became head worker for the Child and Welfare Association in Paris for which the French Government awarded her a medal.

She studied at the London School of Economics before returning to the Food Clinic in 1922. Under her guidance, the Food Clinic became a teaching center for students (1926); and in 1936, the Food Clinic Course in Applied Dietetics was approved by The American Dietetic Association and became a teaching center for medical students from the Medical School of Tufts College and for public health, home economics, and social work students from other colleges. In recognition of her leadership in 1943, the name was changed to Frances Stern Food Clinic.

Severe physical disabilities never stopped Frances Stern's vigor, vision, or high standards of work. Teaching, writing of five books and many articles, travel at home and abroad, work in the community and church, and enjoyment of students and friends, filled her life to the end. She died December 23, 1947.

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Serum Cholesterol and Different Dietary Fats[1]

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Logan

DIETARY FAT is one of the nutritional factors that has been implicated as affecting the cholesterol in serum. Recent reviews have discussed relationships between serum cholesterol and other factors including kind of fat (1-3). Findings in this study that corn oil was more effective in lowering serum cholesterol than other food fats agree with the results of other studies with human beings and animals (3-5).

Presented herein are the findings obtained from controlled comparisons of different dietary fats, namely, butter, margarine, hydrogenated cottonseed oil, cottonseed oil, lard, hydrogenated lard, and corn oil, used in normal diets containing ordinary foods. University students served as subjects.

Procedure

Seven food fats were tested using two diet squads, each composed of eight healthy students (four men and four women) of Utah State University. The fats and the order of use are shown in Table 1. An adjustment period in which the diet contained 35 per cent of the calories as fat in the form of lard, cottonseed oil, and butter preceded the use of the first test period. Each test period lasted fifteen days. Between test periods (three to seven days), the subjects ate self-chosen diets. Age, weight, and height for each subject are shown in Table 2.

The fat content of the test diets was 35 per cent of the calories with as much as possible (78 per cent) coming from the fat being investigated. Seven menus were planned and repeated each week. Ordinary foods low in fat were used. Beef round, from which all visible fat was removed, was used as the principal form of meat. Veal, halibut, and chicken were used for variety. All baked products, salad dressings, and so on were made with the fat under study. The food was prepared and served in the Food and Nutrition Laboratory.

The caloric intake was adjusted to maintain the weight of each subject. This required 2900 to 3100 calories per day for the men and 2100 to 2300 for the women. The diets contained 13 to 14 per cent of the calories in the form of protein.

Finger-tip blood samples were taken before breakfast on the first day of the test period and three times a week thereafter. Analyses for free and total cholesterol were made immediately, using the method of Galloway *et al.* (6). The final serum cholesterol values for the test periods were analyzed by variance, and the standard error of difference between means was computed. Analyses of variance were also made for the data for each fat as an aid to measuring the degree of change in serum cholesterol values during each test period.

Results and Discussion

Final mean serum cholesterol values at the end of the test periods varied from 145 mg. when corn oil was the test fat to 203 mg. when butter was used (Table 3). Highly significant differences were obtained when the results for butter were compared with those for all the other fats. The use of butter as a test fat for either diet squad resulted in final cholesterol values that were almost identical (201 and 203 mg. per 100 ml.).

The percentage change in mean serum cholesterol values during any test period depended on the initial serum cholesterol level. This was illustrated by results on the two butter tests. When butter was

[1]This work was a part of the Western Regional Research Project, "Role of Diet in Cholesterol Metabolism." It was supported in part by W-44 funds obtained under the Research and Marketing Act and in part by a grant from the American Dairy Association to Dr. G. E. Stoddard. Approved as Utah Agricultural Experiment Station Journal Paper no. 155, 1960. Received for publication November 6, 1960.

[2]Present Address: Hood River, Oregon.

[3]The authors wish to acknowledge the technical assistance of Maxine B. Lloyd and the assistance of Dr. R. L. Hurst in the statistical analyses.

TABLE 1 Order in which fats* were tested

DIET SQUAD	FAT IN PREVIOUS TEST DIET	FAT IN TEST DIET	IODINE NUMBER	LINOLEIC ACID†	LINOLENIC ACID†
				%	%
1	mixed fats	butter‡	26	—	—
1	butter	margarine	—	—	—
1	margarine	partially hydrogenated cottonseed oil	78	8.5	0.07
1	hydrogenated cottonseed oil	cottonseed oil	107	50.1	0.05
1	cottonseed oil	lard	68	11.1	0.48
1	lard	partially hydrogenated lard	60	4.3	0.48
2	mixed fats	corn oil	124	—	—
2	corn oil	butter	26	—	—

*The butter was obtained from one churning at Utah State University Dairy; the margarine was purchased as one lot; the cottonseed oils and lards supplied by Swift and Company, and the corn oil by Corn Products Refining Company.

†Values furnished by Swift and Company. The arachidonic acid in the lard was 0.31 per cent and in the hydrogenated lard 0.07 per cent.

‡The subjects during this test period were two men and two women.

used for the first diet squad following the pretest period, the initial value was 189 mg., while for the second diet squad, it was 158 mg. when the test period followed the corn oil diet plus three days on self-chosen diets. Since final values were similar, this resulted in a 7 per cent increase during the first use of butter as compared with 22 per cent for the second time butter was used. This latter change was significant at the $p<0.01$ level (Figure 1). However, this increase cannot be considered a real increase, since the initial serum cholesterol value was 15 per cent lower than if it had followed the pretest period. Initial mean cholesterol levels were influenced by the fat used in the previous test period, low initial mean values having occurred following the feeding of cottonseed oil and of corn oil plus three to four days on self-chosen diets. This finding agrees with results reported by others (3).

Significant decreases ($p<0.01$) in mean serum cholesterol values occurred on the margarine, hydrogenated cottonseed oil, cottonseed oil, and corn oil diets. However, the decrease on the first three diets was only 12 per cent as compared with that on the corn oil diet of 22 per cent. Although the corn oil diet was the only one which followed a pretest diet, the initial values were similar for these four diets (178 to 186 mg.). Hence, corn oil was more effective than the other fats in lowering serum cholesterol levels. No change occurred in the serum levels for the diets containing the two forms of lard.

When changes in serum cholesterol values occurred, the greatest change was during the first five to eight days. This finding has been reported previously (2).

The percentage of free cholesterol to total cholesterol was similar for all diets regardless of kind of fat, and for the subjects in both diet squads.

TABLE 2 Age, weight, and height of subjects

SUBJECT	AGE	WEIGHT	HEIGHT
	Women		
	yr.	*lb.*	*in.*
Diet Squad 1			
M.J.	20	138	70
G.R.	23	116	65
S.H.	21	119	64
M.D.	20	147	69
Diet Squad 2			
M.H.	21	114	59
J.S.	21	126	66
A.E.	22	142	67
E.S.	23	110	62
	Men		
Diet Squad 1			
W.L.	23	223	72
C.B.	24	182	67
T.K.	28	125	69
F.B.	25	190	70
Diet Squad 2			
D.H.	22	141	67
F.C.	27	180	72
W.B.	24	172	71
J.M.	22	164	69

TABLE 3 Mean serum cholesterol values at end of test period

DIETARY FAT	TOTAL CHOLESTEROL	STANDARD ERROR OF DIFFERENCE BETWEEN TWO MEANS*
	mg./100 gm.	
Butter	203†	3.70
Margarine	156	
Hydrogenated cottonseed oil	164	
Cottonseed oil	160	
Lard	167	
Hydrogenated lard	177	
Corn oil	145	4.46
Butter	201	

*When the mean for butter was compared with means of the other fats. A pooled estimate of variance was used.

†Adjusted mean. This diet squad had only four subjects.

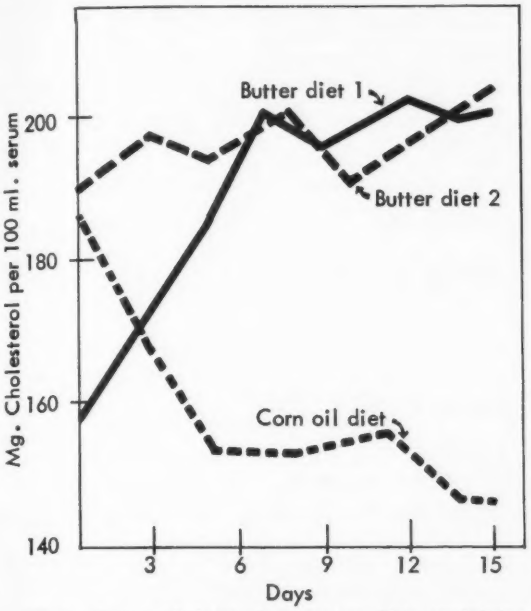

FIG. 1. *Serum cholesterol values on diets containing butter and corn oil.*

Free cholesterol values ranged from 34 to 50 mg. per 100 ml. serum; the range for the percentage free cholesterol was 23 to 28 per cent of the total. These values correspond to those reported by Sperry (7) for normal human serum.

Average dietary cholesterol intakes on the different diets differed by as much as 61 per cent, although 35 per cent of total calories of each diet was provided by fat. The ranges in cholesterol intakes were 187 to 486 mg. for the men and 144 to 374 mg. for the women for the corn oil and butter diets, respectively. Serum cholesterol values showed a positive correlation of 0.67 with dietary intake of cholesterol (Figure 2). Beveridge *et al.* showed (8) that serum cholesterol values of university students increased sharply on intakes of between 13 and 634 mg. cholesterol per day in a homogenized formula diet. Different levels of cholesterol were added to a formula diet in which fat provided 30 per cent of the calories. Not all workers, however, have found a relationship between dietary intake and serum cholesterol values. Keys *et al.* found (9) that variations in cholesterol intake within the range of natural diets did not influence the serum levels of normal adult men. All diets in this study provided daily intakes of cholesterol well below values reported for self-chosen diets. In a survey in Utah (10), male subjects sixteen to seventeen and twenty-five to forty-nine years of age were consuming 671 and 932 mg. cholesterol daily, while women of the same age had intakes of 469 and 545 mg. Similar values were reported from the other western states.

Beveridge and co-workers have shown (11) that

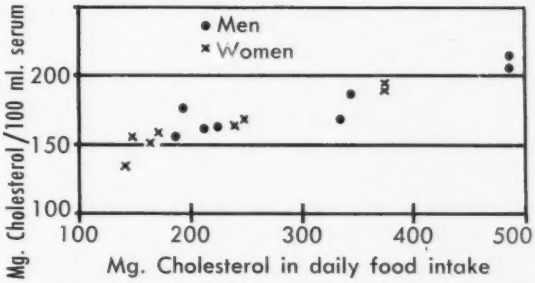

FIG. 2. *Relationship between serum cholesterol values and dietary cholesterol.*

the cholesterol in butter accounts for at least part of its hypercholesterolemic activity. Although dietary cholesterol in this study was highest on the butter diet, the daily intake was only slightly more than half that found in the Utah self-chosen diets (10). Daily dietary intakes were still less on the other fats. The corn oil diet, with the least cholesterol, contained only one-third to one-fifth the cholesterol found in the self-chosen diets.

Summary

Serum cholesterol levels were studied in healthy university students (four men and four women) maintained for fifteen days on diets composed of ordinary foods and which contained seven different fats: butter, margarine, cottonseed oil, hydrogenated cottonseed oil, lard, hydrogenated lard, and corn oil. The fat provided 35 per cent of total calories.

Mean serum cholesterol levels at the end of the test periods were highest when butter was the test fat and lowest for corn oil. Differences were highly significant.

Significant decreases in serum cholesterol levels during the test periods occurred on the diets containing margarine, cottonseed oil, hydrogenated cottonseed oil, and corn oil. The decrease was 22 per cent on the corn oil diet, 12 per cent for the other fats. Serum cholesterol levels on the butter diet which followed the pretest period increased slightly but the change was not significant. Likewise, changes on the two lard diets were slight.

The change in serum cholesterol that resulted from the feeding of a specific fat depended on the initial serum cholesterol value and the cholesterol content in the test diet. Serum cholesterol values in this study showed a positive correlation of 0.67 with the levels of dietary cholesterol.

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Nutritive Value of Cooked Pork

Analyses of common retail cuts of meat cooked by usual household methods were done by Ruth M. Leverton and George V. Odell. Different portions of each cut—the extremely lean, the lean-marbled-with-fat, and the obviously fat were analyzed separately. Since all of these portions are not always used, the breakdown makes possible more accurate calculations of diets. Reprinted below are the data on pork (per 100 gm.) from their report (*The Nutritive Value of Cooked Meat.* Oklahoma Agricultural Experiment Station Publication MP-49, March, 1958).

CUT	CALORIES	PROTEIN	FAT	MOISTURE	ASH	PHOSPHORUS	MAGNESIUM
		gm.	*gm.*	*gm.*	*gm.*	*mg.*	*mg.*
Chop—loin center cut, lean portion	250	34.6	11.3	53.0	1.31	263	25.3
Blade steak							
Lean portion	219	30.9	9.7	58.6	1.30	260	25.4
Lean plus marble	277	29.0	17.0	53.1	1.21	227	23.8
Fresh ham steak							
Lean portion	223	38.6	6.4	53.9	1.42	269	28.0
Lean plus marble	237	37.0	8.8	52.6	1.47	276	28.1
Boston butt							
Lean portion	200	28.8	8.6	61.6	1.25	249	23.5
Lean plus marble	283	25.4	19.3	54.2	1.12	225	21.8
Picnic shoulder, fresh							
Lean portion	179	29.1	6.0	64.3	1.08	240	24.0
Lean plus marble	246	25.9	15.0	58.4	1.05	218	21.7
Ham, cured butt end							
Lean portion	159	27.6	4.6	64.1	3.82	218	22.2
Lean plus marble	205	25.1	10.8	60.4	3.84	205	21.0
Ham, cured shank end							
Lean portion	176	28.1	6.2	62.9	3.22	206	20.7
Lean plus marble	234	25.6	13.8	57.7	3.06	186	19.5
Sirloin roast							
Lean portion	197	31.1	7.1	60.3	1.33	268	23.7
Lean plus marble	227	30.0	11.0	57.4	1.32	262	23.8
Tenderloin, entire portion	239	30.6	12.1	56.2	1.50	301	25.9
Shoulder butt, cured							
Lean portion	199	26.8	9.3	58.1	5.42	210	22.2
Lean plus marble	318	22.6	24.5	47.6	4.78	190	20.3
Bacon							
Canadian style	260	30.3	14.5	46.5	7.66	218	25.7
Regular sliced	684	32.9	60.2	3.3	6.25	231	24.7
Sausage, link	421	20.4	37.0	39.4	3.33	162	17.0

Polyunsaturated Lipids and Tocopherol Requirements[1]

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IT HAS long been recognized that depot fats can take on some of the characteristics of ingested fat. Hog raisers have made practical use of this fact for many years. From the time I was a student in Professor Mendel's laboratory, I remember quite vividly the demonstrations of the marked differences in the tissues of animals fed large amounts of unsaturated fats and how the professor showed us photographs of hog carcasses labelled "oily," "soft," and "hard" depending on the diet consumed by the hogs (1). Because the more unsaturated fat in the meat was commercially undesirable, many of us were conditioned to think that feeding large amounts of unsaturated fat was to be avoided.

Actually, the record on the effect of dietary fat on the composition of animal tissues goes back to 1882, when Lebedeff (2) first starved two dogs to decrease their depot fat, and then fed them diets rich in linseed oil and mutton tallow, respectively. As a result, some of the fat from the dog fed linseed oil did not solidify at 0°C., whereas the animal fed mutton tallow had laid down fat that resembled mutton tallow, with a melting point above 50°C. An excellent record of a great deal of the early work on the effect of fat on tissue composition can be found in the review by Anderson and Williams (3).

More recently, it has become popular to anticipate that you may derive some benefit if you eat more unsaturated fat. But what are the disadvantages, aside from obesity, of some of the excesses now being practiced by many who have gone overboard in substituting unsaturated fat for other calories in the diet? While admitting that the present state of our knowledge does not permit us to draw conclusions, one cannot help wondering about the possible deleterious effects of feeding larger amounts of unsaturated fat on our health and appearance, when one recalls what happens to animals that have been raised on excessive amounts of unsaturated fats.

The Elgin Investigation

The interest of the Elgin investigators on the effects of feeding and storing polyunsaturated lipids developed from a study of the tocopherol requirements of man, a project which has included dietary control of lipids ingested, and which has now been in progress for over seven years. This presentation will attempt to summarize a part of this work, much of which is in process of being published elsewhere.

Briefly stated, the organization of the project (4, 5) was as follows: Thirty-eight male subjects were divided into three groups: Group B (nineteen subjects) received a daily basal diet which contained approximately 3 mg. tocopherol, an amount which is low, but not much different from that which many of you consume on some days; Group BE (nine subjects) received the same diet plus a supplement of 15 mg. D-alpha-tocopherol acetate per day; and a third group (eleven subjects) received the regular hospital diet *ad libitum* (called group HD). The basal diet provided 2200 calories, 47 gm. good protein, and 55 gm. fat, of which 30 gm. was lard. After two and a half years on this diet, although all the unsupplemented subjects were already showing positive reactions to the peroxide hemolysis test

[1]Data taken from research supported by the National Institutes of Health (A-1126), The National Vitamin Foundation, Inc., and the Illinois Mental Health Fund. Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 21, 1960.

[2]The authors are indebted to Dr. F. Navazio, B. J. Meyer, W. C. Wilson, and A. A. Zeman for their clinical collaboration and to the members of the National Research Council's Committee on Nutritional Studies at Elgin State Hospital for their sponsorship and advice.

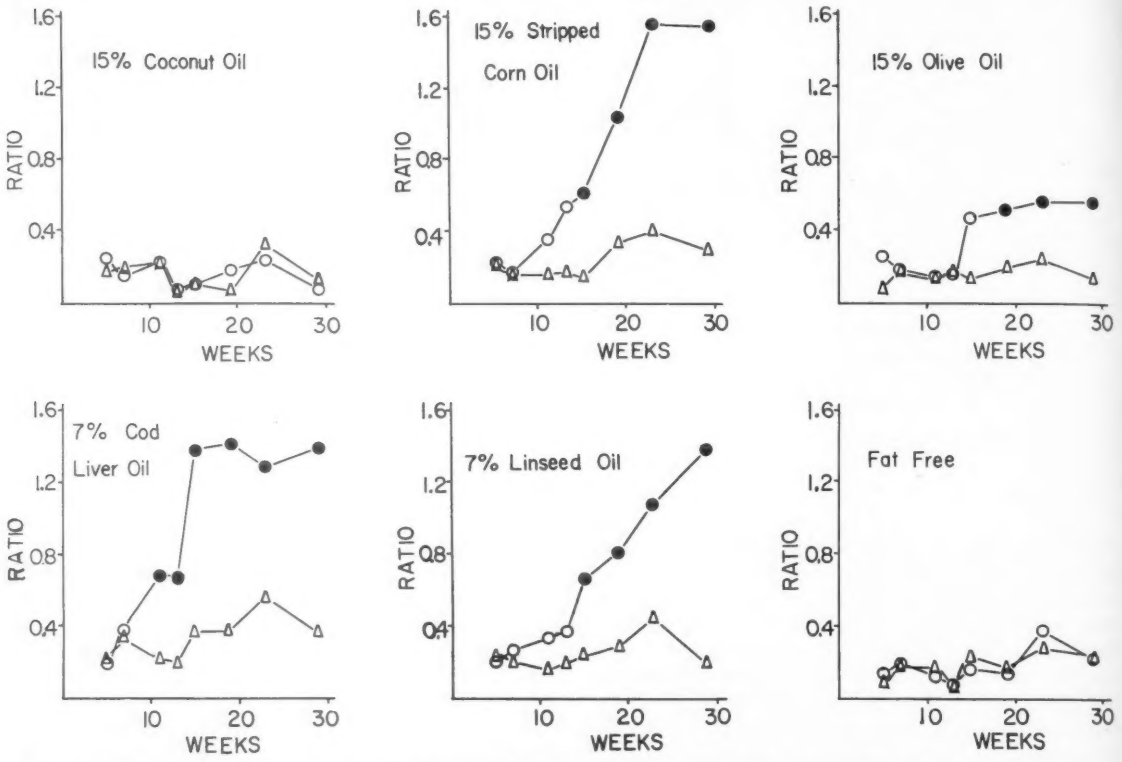

FIG. 1. *Creatine:creatinine ratios in tocopherol-deficient rats. Relationship of type of lipid in diet to the production of creatinuria. Note that unless the diet provided a liberal amount of peroxidizable lipids, there was no effect on the relative amount of creatine (ratio) excreted, showing that tocopherol was not required to prevent creatinuria when ingestion of peroxidizable lipids was low. Circles represent animals that received no tocopherol; triangles designate animals given 4 mg.* D-*alpha-tocopherol acetate per week, orally. Statistically significant points in curves, as determined by the t test where probability was better than 95 per cent, are indicated by the filled circles. The diets contained 25 per cent casein and the amounts of fat indicated. The so-called fat-free diet contained 0.2 per cent stripped corn oil to provide the trace of essential fatty acids necessary. Additional details on this experiment will be published elsewhere. Figure reprinted from the* American Journal of Clinical Nutrition *from original work by Horwitt (5).*

(5), the plasma tocopherol had reached a plateau at an average level of about 0.5 mg. per 100 ml. or at about half of the level at the start of the experiment. At this time, the lard was replaced with an equivalent amount of corn oil, from which the tocopherol had been removed. Nine months later, after the average plasma tocopherol had dropped to about 0.4 mg. per 100 ml., the corn oil content of the diet was doubled, at the expense of carbohydrate. Since then, levels between 0.1 and 0.2 mg. per 100 ml. have been regularly observed in the unsupplemented subjects. It was apparent that each increase in the level of linoleic acid intake decreased the level of plasma tocopherol.

Unsaturated Fats and Tocopherol Needs

The effect of the ingestion of polyunsaturated fatty acids on tocopherol needs is more easily demonstrated in animals than in man. For example, if creatine excretion is used as a criterion of tocopherol deficiency in rats (5, 6), it can be shown (Figure 1) that if the lipid used was high in polyunsaturated fatty acids, signs of deficiency became obvious in about twelve weeks. On the other hand, if the diet was low in polyunsaturates, no creatinurea was observed. Similarly, in chicks, if the onset of encephalomalacia is used as an indication of linoleic acid-tocopherol imbalance, it can be shown that 15 per cent butter, 4 per cent stripped lard, 20 per cent olive oil equivalent to 0.5, 0.4, 0.9 per cent linoleic acid, respectively, do not produce encephalomalacia. On the other hand diets providing more linoleic acid, i.e., 15 per cent stripped lard or 4 per cent corn oil, equivalent to 1.5 and 2 per cent linoleic acid, respectively, produce a high incidence of this disorder. Table 1 shows how the requirement for tocopherol to prevent encephalomalacia in the chick increases when ingestion of corn oil, which contains approximately 50 per cent linoleic acid, is increased (7, 8).

TABLE 1 Effects of varying dietary corn oil and vitamin E supplementation on incidence of encephalomalacia*

STRIPPED CORN OIL (PN 50)	INCIDENCE OF ENCEPHALOMALACIA†				
	No supplementation	0.2 mg. per week d-alpha-tocopherol	0.5 mg. per week d-alpha-tocopherol	1.0 mg. per week d-alpha-tocopherol	2.0 mg. per week d-alpha-tocopherol
None	0/10	1/15	0/9	0/15	0/5
1%	1/10	1/10	0/9	1/9	—
2%	2/6	1/6	—	0/6	0/6
2.5%	4/10	2/10	0/9	0/9	—
4%	16/19	11/19	2/10	2/18	0/7
8%	8/8	4/17	—	1/8	0/7

*From Century and Horwitt (7). Reprinted with permission from *A. M. A. Archives of General Psychiatry.*
†Figure preceding diagonal indicates number of cases; number following diagonal indicates size of experimental group.

In an attempt to correlate the accumulation of some of the more active essential fatty acids in the brain with the observations that encephalomalacia in the chick is more prevalent when such fatty acids are present in the diet, chicks were fed synthetic diets that contained either 4 per cent corn oil or 4 per cent coconut oil. The mitochondria from the brain were analyzed by gas chromatography for fatty acid composition. Table 2 illustrates the differences obtained on three selected fatty acids. Note that there is a marked increase in arachidonic and docosapentanoic acids in the brain mitochondria when corn oil is fed instead of a more saturated fat. These and other factors related to the problem of fatty acid depositions in the brain are now being intensely investigated. Such work is especially pertinent since the first case of human cerebellitis similar to chick encephalomalacia was noted about two years ago (9).

Fatty Acids in Human Erythrocytes

One of the more striking examples of the effect of diet on tissue composition is found in human erythrocytes, in which the lipid composition can be closely related to past dietary consumption (10). To date, of more than twenty fatty acids studied in the erythrocyte, the linoleic acid appears to give the most significant alterations. In the fifth year of the experiment on human requirements, after the subjects had been on the diet which used corn oil as the source of fat for three years, coconut oil was substituted for corn oil (60 gm. per day) in nine subjects. At this time, the fatty acid composition of the erythrocytes of all subjects, including those on the hospital diet, was determined by gas chromatography and the rate of change in the fatty acids of the erythrocytes was evaluated.

Figure 2 shows that the subjects who had been on the corn oil diet averaged approximately 15 per cent erythrocyte linoleic acid, whereas those on the uncontrolled hospital diet showed the more normal figure of 9 per cent. After sixteen months on coconut oil, which contains only about 2 per cent linoleic acid, the linoleic acid level of the erythrocyte had decreased to about 11 per cent. At this time, the linoleic acid in the depot fat, determined on lipid obtained by aspiration according to the method of Hirsch *et al.* (11) of the subjects remaining on the corn oil diet was over 30 per cent. For those who had been fed corn oil for three years followed by sixteen months on coconut oil, it was about 15 per cent, and for those who had been fed the hospital diet, about 8 per cent. It is apparent from these data that, since both the erythrocyte and depot fats take so long to alter their fatty acid composition, the erythrocyte can provide an easily accessible and reasonably reliable estimate of past average lipid consumption. Apparently, it takes considerable time to alter the composition of all the stored lipids which provide the fatty acids used in the synthesis of the erythrocytes. More on this will be published elsewhere.

Of special interest is a recent compilation of data, obtained during the past three years, of the erythrocyte life cycle in man when the polyunsaturated lipids of erythrocytes was increased and the tocopherol was decreased. The subjects used were selected from the dietary group described above. The technique used is that of Strumia *et al.* (12), with modifications suggested by Cooper and Owens (13), in which blood was removed from the patient,

TABLE 2 Selected fatty acids on lipid of brain mitochondria of thirty-day-old chicks on corn oil vs. coconut oil diets

DIET	LINOLEIC ACID (18:2)*	ARACHIDONIC ACID (20:4)*	DOCOSAPENTANOIC ACID (22:5)*	TOTAL
	%	%	%	%
4% corn oil	0.9±0.1	6.9±0.7	3.2±0.6	11.0±1.2
4% coconut oil	0.8±0.2	2.7±0.5	0.7±0.2	4.2±0.8

*Average of five samples with standard error of mean.

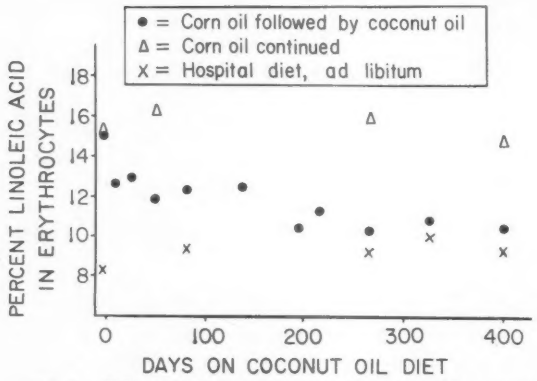

FIG. 2. *Effect of dietary lipid on linoleic acid content of human erythrocytes. Until zero day,* ● *and* Δ *subjects had been on corn oil diet for three years. At zero day, subjects designated by* ● *had the corn oil in their diet replaced by coconut oil, while* Δ *subjects continued to receive corn oil. Subjects designated by* × *consumed the regular hospital diet,* ad libitum *during the entire period.*

labelled with Cr^{51} and reinjected into the same patient's blood stream. Survival time of these reinjected cells was evaluated by isotope-counting techniques. Table 3 gives a representative sample of the data obtained, showing that the subjects on the tocopherol-depleted regimen had a slightly shorter erythrocyte life than did those not on this diet. These observations confirm the previously recorded observations of Marvin, Dinning, and Day (14) on monkeys that were more severely restricted in tocopherol than our human subjects.

Conclusions

Only a few high lights of our study have been presented. Although the project is not yet completed, the conclusions that have been derived from the work to date are:

(1) The tocopherol requirement is a function of the amounts of polyunsaturated lipids in the diet and in the tissues.

(2) The fatty acid composition of tissues, lipoproteins, and phospholipids can be altered by varying the fatty acid composition of the diet.

(3) Linoleic acid appears to be the most significant polyunsaturated component in normal American diets.

(4) When polyunsaturated fatty acids in the diet are low, the need for tocopherol decreases to very low levels, but past dietary habits which have affected tissue composition must be taken into consideration in evaluating tocopherol needs.

(5) Experiments on tocopherol requirements of adult man may be interpreted to show that the requirements vary from a minimum of less than 5 mg. per day to a maximum of about 30 mg. per day. Five mg. per day is the amount found in diets high in animal tissue components which are relatively low in unsaturated lipids, and 30 mg. alpha-tocopherol, even when given for several months, appears to be barely adequate to reverse the high peroxide hemolysis effects produced by prolonged feeding of a diet providing 60 gm. corn oil per day. These data on human beings correlate well with the results of animal experiments where it is possible to use more critical pathologic criteria, such as chick encephalomacia and rat nutritional muscular dystrophy.

TABLE 3 Life of erythrocytes after seventy-six months on diet (Cr^{51}) technique

SUBJECT	PLASMA TOCOPHEROL	PEROXIDE HEMOLYSIS	TOTAL LIFE
	mg./100 ml.	*%*	*days*
B-1	0.11	97	113
B-3	0.07	97	110
B-5	0.16	92	114
HD-4	0.93	12	128
HD-7	0.50	3	121
HD-9	0.85	1	117

(6) It may take many months to change the lipid composition of the body tissues using isocaloric diets. Therefore, one need only analyze samples of erythrocyte for their fatty acid content to obtain information on the recent past lipid consumption of an individual.

(7) Feeding coconut oil, which is high in lauric and myristic acid and low in linoleic acid, for over a year caused alteration in the linoleic acid content of the erythrocytes of subjects who had been on a corn oil diet for more than two years. This brought the composition of their erythrocyte fatty acids more in line with those of patients on the hospital diet.

(8) Present interpretation of evidence available leads to the conclusion that excesses of linoleic acid in the tissues could be undesirable, as extraordinarily large amounts of tocopherol are needed to prevent lipid peroxidations after feeding excesses of corn oil. Until we know more about this phenomenon, one must question the propriety of changing national dietary habits by recommending increased consumption of unsaturated lipids high in linoleic acid.

(9) Changes in diet will alter mitochondrial lipids of all tissues, including those of the brain.

(10) The time of erythrocyte survival is shortened in man when a diet with a relatively low tocopherol to linoleic acid ratio is fed for prolonged periods.

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Nutritive Value of Milk

A review of the literature, mainly of the last two years, on the nutritive value of milk and its products as it relates to human nutrition has lately been published by McGillivray and Porter. They cite 289 references.

The reaction of the human infant to cow's milk formulas continues to be the subject of much investigation. These authors conclude from the evidence: "It is now clearly established that cow's milk, intelligently modified, is for all practical purposes in no way inferior to human milk for infant feeding." A number of studies are cited showing that infants weaned early from breast milk to a cow's milk formula exhibit better skeletal development and more ossification centers than when breast feeding is prolonged. Research continues, however, on various phases of the subject, e.g., the supposed benefit from "bifidus factor" in human milk. Because of the great variations in human milks, it is difficult to establish the kind of controlled observations so necessary in scientific work.

The lesser content of essential fatty acids in cow's milk fat as compared with human milk is considered by some infant feeding researchers to be important, by others, not. The possible implications of milk fat and other animal fats in the increasing incidence of coronary disease appears to be increasingly questioned. One experiment is reported in which 50 gm. milk fat as milk, cream, or cheese definitely lowered blood cholesterol levels.

Vitamin B_6 in milk products used in infant feeding has had particular attention because of the discovery a few years ago that a B_6 deficiency could precipitate convulsive seizures in infants, a condition originally observed on feeding a special manufactured product that had been exposed to excessive heat of sterilization. Commercial processing of milk, however, as in the manufacture of evaporated milk or dry milk, has been found not to reduce B_6 potency to hazardous levels.

Contamination of milk with strontium-90, not yet regarded as a nutritional hazard, continues to be studied. Reports from various regions indicate that pastures and herbages are becoming increasingly contaminated. Fortunately, the cow is able in large measure to discriminate against strontium.

Recent studies indicate that true cow's milk allergy in infants is in the order of 1 per cent or less. As milk allergy is generally associated with the lactalbumin, application of heat, as in sterilization, often overcomes this difficulty.

That milk protein satisfactorily balances the amino acid deficiencies of cereal protein and that the further addition of lysine and threonine does not improve the biologic values of such intermixtures has lately been demonstrated.

These authors also review the current literature on the chemical composition of milk as affected by breed, feed, season, and so on. Recent data on human milks and the milks of animals are also documented.—*Abstracted from: "Nutritive Value of Milk and Milk Products," by W. A. McGillivray and J. W. G. Porter. J. Dairy Research 27: 309, 1960. Contributed by Frank E. Rice, Ph.D., Adviser in Food and Nutrition, Dairy Society International, Chicago.*

A Forty-Year Look at Nutrition Research[1]

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IN THE MARCH 1960 issue of *Fortune*, a series of articles was started on "How Good Is American Science?" The year 1920 was chosen as a starting point, because it coincided roughly with the earliest work of men still living, and because a forty-year span was considered ample to show how many of the current problems in science have evolved.

As I look back, I find that I have been closely connected with work in nutrition for nearly forty years. To be sure, the science of nutrition was not fully recognized in 1920; actually, the American Institute of Nutrition only recently celebrated its silver anniversary. Nevertheless, I had the opportunity of learning of nutrition studies at the University of Wisconsin shortly after entering as a freshman in 1919. Those of us who have had the privilege of being active during these forty years look back on probably the most productive period in the development of our knowledge of nutrition.

Certain basic principles were established before 1920 and certainly, as we look forward to the remaining forty years of this century, great advances will take place in our understanding of living matter and the metabolism of nutrients in the living cell. It has been a very satisfying experience for me to take part in some of the newer developments, especially in the field of trace minerals, and vitamins.

There were many fortunate circumstances which made it possible for me to be active in this field. In the first place, I was born on a farm where I had an opportunity to observe living matter, both plants and animals. As a youngster, I had a burning curiosity about the growth and development of plants. I was also born close enough to Madison, Wisconsin, to learn of the early experiments of Dr. S. M. Babcock while I was still in grade school. As a college freshman, I was interested in general chemistry, but I was not fascinated by it. It was only after I had taken agricultural chemistry under E. B. Hart that I was certain I wanted to work in either biochemistry or bacteriology. I was also privileged to have my undergraduate training back in the days when it was fashionable to have the senior thesis. I had the privilege of working on my thesis under Dr. Harry Steenbock, on a problem which involved chemical isolation of a physiologically active substance in buckwheat; this, of necessity, required testing of each fraction on an experimental animal.

Opportunities of Association

I was given a research assistantship beginning theoretically on July 1, 1923—but both Professor Hart and Dr. Steenbock expected me to be active the afternoon of commencement exercises. That summer experience was a fascinating one for me. There were no course assignments, and I spent my entire day and often my evenings working in the laboratory. For the first time, my education was not interrupted by classes. Furthermore, I gained a very broad experience because when the older assistants took their vacations, I was allowed to continue some of their work—and, incidentally, also to wash all the dirty glassware they had left behind. I was also fortunate in that I had teaching assignments during my entire graduate program. I had done some teaching during my senior year, but in the fall of 1923 I was a teaching assistant in biochemistry, giving the course for home economics students.

Teaching experience in itself is an essential for most types of research, especially in nutrition. These assignments provided an opportunity for me to learn of the practical problems involved in nutrition as well as the experience of transmitting new knowledge to non-scientific people. It also allowed me to become acquainted with home economics students and the staff in our School of Home Economics. For several years, a number of home economics students carried on their senior thesis work with me; this perhaps gave me true insight into problems of human nutrition. The specific problem involved was the importance of iron and copper in the

[1]Presented at the History of Nutrition Luncheon held during the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 21, 1960.

prevention of anemia, and in order to work with human subjects, it was necessary for me to have a cooperative program with Dr. Dorothy Reed Mendenhall, the physician who inaugurated the child health centers in the city of Madison.

Another great advantage was that related to the organization of the University of Wisconsin. In the first place, all colleges are on one campus and therefore, although the Department of Biochemistry was in the College of Agriculture, we had close association with the Departments of Chemistry and Physics, the Medical School, and many other areas that we needed for help in our work. With the Medical School only a few blocks from our laboratory, I took a minor in medical physiology for my doctoral degree and had the opportunity to work closely with many of the professors in the Medical School. As part of the College of Agriculture, we had access to the Poultry Department, which supplied chickens; to the Animal Husbandry Department, where we worked with many of the farm animals; and to the Department of Bacteriology, where we could work with micro-organisms.

All of these contacts established a philosophy on my part; namely, that in order to thoroughly understand nutrition of the human being, we must use a variety of experimental animals.

You have all heard arguments regarding the most appropriate animal for use in human nutrition studies. Some say the dog, some say the monkey, and so on, but as we look back on past experiences, I think it is obvious that no one animal could have given us the information we have today.

I had one more experience before I settled down to regular teaching and research beginning in 1931; that was a year's research work at the University of Cambridge in England. There I found that the studies on the living cell might be approached from many different points of view. The emphasis of the work at the Sir William Dunn Institute in Cambridge was in the area of enzymes, and I brought back to my laboratory a Warburg apparatus which was one of the first available, at least in the Midwest. These studies allowed me to explore how vitamins function. It was extremely interesting to me when I first started to think about these problems, that even the early workers on vitamins seemed to feel that there was something mysterious about these substances. Of course, when specific vitamins were isolated and their chemistry established, some of this mysticism disappeared, but even so, one wondered how they functioned in the body. I was privileged to work during these early developments and saw the demonstrations that vitamins functioned as co-enzymes in many respiratory mechanisms.

Early Developments in Nutrition

With this background then, and the opportunity to work not only in a department of biochemistry covering all aspects of living matter but also with fine graduate students, it is no wonder that I had the privilege of following many of the early developments in the field of nutrition. I would like to outline very briefly some of these developments.

I published my first scientific paper in 1924, together with Hart and Steenbock; it demonstrated that ultra-violet light would improve calcium and phosphorus equilibrium in the milking goat. Previous work had shown that ultra-violet light increased growth and was necessary for normal bone formation in the rat, but this was the first demonstration of calcium utilization in mature animals.

Research on Anemia

Although I worked with others in studies on the calcium assimilation in lactating cows, the next project which attracted my attention involved the development of anemia in young rats fed milk diets. This project was carried out with Steenbock, Hart, and James Waddell, and led to the finding that copper is an essential element for hemoglobin formation.

In 1926, I developed a method to determine iron in biologic materials, which emphasized the importance of analytical procedure if we were to study trace mineral elements. In this connection, it is interesting to point out that we studied the effect of diet on the iron content of milk and later made similar studies for copper, manganese, and zinc. Other studies were conducted to see if we could influence the iron and copper content of eggs by altering the hen's diet.

The work on anemia was extended to young pigs in 1930, and a practical demonstration was made on how to prevent anemia in these animals. When it was possible to grow rats very well on milk diets supplemented with iron and copper, we could then demonstrate that manganese was necessary for maximum growth on milk diets. This allowed us to extend studies to pigs and dogs, and together with Dr. John Gonce of the Department of Pediatrics, we carried dogs through several generations on mineralized milk. As I mentioned earlier, this permitted us to apply these findings to the infant, and I might add that back around 1930, there was a great deal of anemia in infants. Recognition of this brought about improvements, in that many of the cereals used in infant diets were supplemented with iron and some copper.

Another interesting development had to do with the availability of iron. It soon became apparent that all forms of iron present in food were not readily available. Some of you will remember the controversy over the value of spinach as a source of iron back in the 1930's.

Studies on the B Vitamins

My introduction to studies on the B vitamins came

from work with chicks fed diets heated under different conditions. Back in the 1930's, Professor Hart was especially interested in learning why complete vegetable diets were not adequate for certain animals. He had in mind such animals as the mink, which apparently required fairly large quantities of animal products. This also involved the relative value of animal and vegetable proteins. The effect of heat—different types of heat—on natural diets gave us an opportunity to assay for "vitamin B_1" and "vitamin B_2." The dermatitis which appeared in chicks fed heated rations under dry conditions suggested that we might be dealing with pellagra. We know today, of course, that this was not a niacin deficiency, but a deficiency of pantothenic acid and perhaps other factors.

While we used chicks in the early studies of the anti-pellagra factor, we finally turned to dogs for the final assay procedures. After the isolation of the nicotinic acid and the demonstration by medical workers that this was active in human pellagra, it was later learned why rats were immune to pellagra while dogs were relatively susceptible. It all depends on the relationship between niacin and tryptophan and the relative ability to convert trytophan into niacin.

Together, then, with the use of chicks, rats, and other animals, we went on to study additional B vitamins, such as vitamin B_6, folic acid, biotin, and so on. We continually wondered why we could not produce pernicious anemia in experimental animals since we felt that our diets were becoming more highly purified and we should finally be able to produce the efficiency of the anti-pernicious anemia factor. Again, we know today that very small quantities are needed and even casein in our synthetic diets carries adequate vitamin B_{12} to give protection. Furthermore, the entire relationship of intestinal-flora to the production of B vitamins became a very important project in our program. We know now that vitamin B_{12} may be synthesized at varying rates in the tract of different animals and when different carbohydrates are fed. I wish, however, to go back to the original demonstration that we made in our laboratory regarding synthesis of vitamins by the intestinal flora.

In 1942, Black, Overman, Link, and I published a paper entitled "Effect of Sulfaguanidine on Rat Growth and Plasma Prothrombin" (2). This was the first demonstration that the addition of sulfa drugs to the diet of animals reduced their growth. This led to an extensive study of the changes in the intestinal flora of rats fed purified diets containing different sulfanilamides. This work was done by Ola Gant, Beverly Ransone, and Elizabeth McCoy, and many, many papers have been published since that time. In fact, I published a review on the role of intestinal bacteria in nutrition in the JOURNAL OF AMERICAN DIETETIC ASSOCIATION in 1946 (3). Diets containing sulfa drugs were also used for establishing some of the newer members of the vitamin B complex. In 1943, Miss Ransone and I published a paper (4) on the value of biotin, folic acid, and concentrates from liver extract in the diet of rats fed succinylsulfathiazole.

Perhaps the most interesting paper in this area was the one published in 1946 entitled, "Use of Sulfasuxidine, Streptothricin and Streptomycin in Nutritional Studies with the Chick" (5). In these studies we showed for the first time that we might get a growth stimulation rather than a growth depression by adding certain antibiotics. This was the forerunner of the extensive use today of antibiotics in animal feeds for many different species.

Animals in Nutrition Research

Earlier, I mentioned the use of a variety of different species for studying nutrition. I might review just a few of those that I have had experience with during the last thirty years.

In 1944, McIntire, Schweigert, and I published our first paper on nutrition of the cotton rat (6). This report was the first of a large number of papers dealing with the effect of various dietary constituents on dental caries in the cotton rat. We did not ignore the golden hamster, since we published several papers on nutrition of this animal, although we found no great advantage in using this animal over the rat and the guinea pig.

This reminds me of the extensive developments in studies with guinea pigs. When I was an undergraduate student, I remember Dr. Helen Parsons and Dr. Samuel Lepkovsky studying the ascorbic acid requirement of guinea pigs. At that time, a diet of natural products was used. The problem of maintaining this animal on a synthetic diet necessitated other studies; in recent years, of course, it has been possible to prepare a purified diet for the guinea pig as well as for animals such as the rat. However, there are certain special requirements, such as a higher level of casein and certain amounts of bulk. These studies have also been carried out by Mary E. Reid of the National Institutes of Health.

We also conducted a series of experiments on the monkey, largely for the purpose of understanding the nutritional requirements of an animal so widely used in research on infantile paralysis. The complete nutritional requirements were worked out, which led me, for a short time, into the field of infantile paralysis and studies of the relation of nutrition to a virus infection. It was interesting to find that a deficiency of certain nutrients, especially thiamine, greatly retarded the development of paralysis after inoculation with the polio virus.

After a while, the nutrition of the trout attracted our attention. John Field, E. F. Herman, and I studied some of the early requirements (7), and additional information regarding the nutritional

requirements of trout was reported by McLaren, Herman, and I (8).

It is unnecessary to mention again the extensive use we made of the chick, the rat, and the dog in all of our studies. Each contributed to the early studies on certain vitamins or trace mineral elements, but the most interesting part of the work was explaining why the requirements of various nutrients were not the same for different species.

The most fascinating development was undoubtedly the use of micro-organisms for the assay of vitamins and later amino acids. The first assay was developed by Snell and Strong (9), and I remember well the necessity of encouraging these workers to use micro-organisms in nutrition studies. The tremendous application of microbiologic assay, as known to all of us, not only greatly simplified the determination of vitamins but actually gave us an opportunity to measure the amino acid content of practically all of our food.

Amino Acids

I mentioned that I was interested early in the mechanism of action of vitamins and demonstrated that in vitamin deficiency the activity of certain enzymes decreased in the tissues. It was also possible to show the effect of the deficiency of certain amino acids on tissue enzymes.

The increased knowledge of the amino acid content of diets led to the demonstration of the importance of amino acid balance or conversely the deleterious effect of amino acid imbalance. Again, I presented a review in the JOURNAL OF THE AMERICAN DIETETIC ASSOCIATION in 1956 (10) on amino acid balance in nutrition.

Need for Communication

I have mentioned only a few of the experimental studies that I had the privilege of carrying out, but I think it is obvious that while all of my studies were in the general area of biochemistry and nutrition, there was a great variety of approaches and experimental procedures. This in itself was most fascinating, although I believe the most interesting part of my forty years' experience was my association with a large number of experimental workers —first, my teachers and co-workers from many different departments and later, with a great number of graduate students. I suppose I have carried on experimental work with more than a hundred graduate students. I am sure that many of the new ideas came from them. I used to say that my greatest contribution was the fact that I carried new information from one graduate student to another.

The question of communication is still a very important one in the field of scientific work. Graduate students will often spend their last cent to go to a scientific meeting in order to discuss results freely with other workers, but will often have great hesitancy in discussing results with their desk partners or other students. Today, the rate of communication has been increased but the tendency for secrecy still prevails. If I have made any contributions in my teaching during the last forty years, it has been in this area of attempting to encourage young research workers to communicate freely their ideas and their findings.

Perhaps I might conclude by quoting from the article on "The Biologist" in the June 1960 issue of *Fortune* (11):

> And while the scientist's view of the world is always subject to change without notice, the intricate edifice of verifiable fact and tested theory that has been patiently created in just a brief few hundred years is man's most solid achievement on earth.

I have been fortunate to see much verifiable fact established in the field of nutrition.

Such is my self-examination. Thomas Mann is credited with "But self-examination, if it is thorough enough, is nearly always the first step toward change . . . No one who learns to know himself remains just what he was before."

Although I have not remained as a laboratory worker, I look back on forty years of very interesting work in nutrition. The history of this period will always be very dear to me.

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Lesser Known Vitamins in Foods[1]

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Many tables of food analyses are available for the computation of the better known food nutrients. However, none brings together, in convenient form, some of the less frequently considered vitamins, namely B_6, pantothenic acid, biotin, folic acid, choline, and inositol.

Judged by standard tables, the majority of American diets appear reasonably adequate in nutrient content. However, the possibility of a deficiency of other nutritional factors frequently arises but is not commonly investigated for lack of tables by which these factors could be readily assessed.

Since the authors found it necessary to put forth considerable effort to gather and compile this information for the study of modified diets, it was felt that its publication might be of value to others.

The data for the table were obtained from many sources (1-42). Department of Agriculture handbooks on folic acid (1) and pantothenic acid (12) provided most of the figures for these two nutrients, although data for values for foods not listed in these and also for the other four vitamins were obtained mainly from original literature. In a few instances, they were taken from other compilations or abstracts. The titles of the articles frequently indicate the specific nutrients studied. Some information was received directly from manufacturers and growers (41, 42).

Certain problems were encountered. Data had to be drawn from analyses done by different workers over a period of years (1942-1960). During this time, assay methods underwent progressive changes. Apparent inconsistencies occur when results obtained several years ago are compared with data from more recent studies. For example, older determinations of pantothenic acid, unless done by animal assay, gave results only slightly higher than the free vitamin (12). Current methods liberate bound forms of the acid before assay, and much higher values are reported. Considerable time and care has been spent to include in this compilation the most recent and representative findings available. In a few instances, where no other data for B_6 could be found, the figures of Cheldelin and Williams for pyridoxine (26) were included, even though the authors suggest that these may not be comparable to results obtained by other methods. Wherever these appear appreciably lower than other values available for similar types of food, they are enclosed in parentheses.

All six vitamins of this study are abundant in the bran and germ of whole grains, yeasts, and liver, and all are quite widely distributed in nature, yet some foods have been investigated more thoroughly than others. Those low in a certain vitamin have been but little investigated for that ingredient. For example, almost no data could be found for choline in fruits, since it is lacking or is present only in very small amounts in these foods. In general, the information on biotin and inositol content were also less complete than for folic acid, pantothenic acid, and B_6.

With these limitations in mind, this table of vitamin values is presented as a current working tool until better and more complete analyses become available.

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TABLE 1 Vitamin B_6, panothenic acid, biotin, folic acid, choline, and inositol content of foods, edible portion

FOOD	PORTION		VITAMIN B_6		PANTOTHENIC ACID		BIOTIN		FOLIC ACID		CHOLINE		INOSITOL	
	Amt.	Wt.	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent
Cereals and Bread Products														
		gm.	*mcg.*		*mg.*		*mcg.*		*mcg*		*mg.*		*mg.*	
Cereals, cooked, whole														
Barley, whole	½ c.	30(dry)	167.1	557	0.219	0.73	9.3	31.0	15.	50.0	41.7	139.0	117.6	392.0
Corn, yellow	½ c.	20(dry)	93.4	467	0.128	0.64	4.2	21.0	5.3	26.5	12.2	61.0	10.0	50.0
Oats	½ c.	20(dry)	41.0	205	0.300	1.50	4.8	24.0	6.6	33.0	31.2	156.0	53.8	269.0
Rice, brown	½ c.	30(dry)	186.0	620	0.456	1.52	3.6	12.0	6.0	20.0	33.6	112.0	35.7	119.0
Wheat, whole	½ c.	30(dry)	158.4	528	0.411	1.37	4.8	16.0	14.7	49.0	28.2	94.0	110.0	370.0
Cereals, refined, cooked														
Cornmeal														
White	½ c.	20(dry)	(12.2)*	(61)	0.116	0.58	1.3	6.6	1.8	9.0	—†	—	10.2	51
Yellow	½ c.	20(dry)	—	—	0.138	0.69	—	—	1.8	9.0	2.0	10.0	—	—
Hominy, grits	½ c.	20(dry)	(1.2)	(6)	0.068	0.34	0.1	0.7	0.9	4.5	—	—	0.6	3
Rice														
Converted	½ c.	30(dry)	20.4	68	0.393	1.31	2.4	8.0	6.0	20.0	26.7	89.0	6.0	20
Parboiled	½ c.	30(dry)	30.0	100	0.411	1.37	3.0	10.0	5.7	19.0	29.4	98.0	7.5	25
White	½ c.	30(dry)	11.1	37	0.225	0.75	1.5	5.0	4.8	16.0	17.7	59.0	3.0	10
Cereal concentrates, raw														
Rice														
Bran	1 oz.	30(dry)	750.0	2500	0.831	2.77	18.0	60.0	43.8	146.0	51.0	170.0	138.9	463
Germ	1 oz.	30(dry)	480.0	1600	0.900	3.00	17.4	58.0	129.0	430.0	90.0	300.0	111.6	372
Polishings	1 oz.	30(dry)	600.0	2000	1.000	3.33	17.1	57.0	57.6	192.0	30.6	102.0	136.2	454
Wheat														
Bran	1 oz.	30(dry)	414.0	1380	0.900	3.00	4.2	14.0	58.5	195.0	42.9	143.0	—	—
Germ	1 oz.	30(dry)	275.4	918	0.660	2.20	—	—	91.5	305.0	121.8	406.0	231.0	770
Ready-to-eat, dark cereal														
Corn soya	1 c.	30	—	—	0.273	0.91	—	—	24.0	80.0	—	—	—	—
Oats	1 c.	25	—	—	0.230	0.92	—	—	5.6	22.4	—	—	—	—
Wheat														
Bran	1 c.	35	—	—	1.015	2.90	—	—	35.0	100.0	—	—	—	—
Flakes	1 c.	35	—	—	0.304	0.87	—	—	16.4	47.0	—	—	—	—
Shredded Wheat	1 bisc.	30	—	—	0.210	0.70	—	—	16.5	55.0	—	—	—	—
Ready-to-eat, white cereal														
Corn flakes	1 c.	25	—	—	0.047	0.19	—	—	1.4	5.5	—	—	—	—
Rice	1 c	30	(14.4)	(48)	0.114	0.38	0.4	1.3	2.3	7.6	—	—	5.7	19
Bread														
White	1 sl.	23	23.0	100	0.101	0.44	0.3	1.1	3.4	15.0	—	—	11.7	51
Whole wheat	1 sl.	23	96.0	420	0.182	0.79	0.4	1.9	6.9	30.0	—	—	15.4	67
Flour														
White	1 c.	110	363.0	330	0.594	0.54	1.1	1.0	8.8	8.0	57.2	52	51.7	47
Whole wheat	1 c.	120	1116.0	930	1.296	1.08	10.8	9.0	45.6	38.0	—	—	132.0	110
Dairy Products														
Cheese														
Cheddar	1 oz.	30	(18.7)	(66)	0.114	0.40	1.0	3.6	4.5	16.0	13.6	48	7.0	25
Cottage	1 oz.	30	—	—	0.080	0.28	—	—	8.8	31.0	—	—	—	—
Processed	1 oz.	30	—	—	0.136	0.48	1.3	4.6	3.1	11.0	—	—	—	—
Egg														
Whole	1 med.	50	126.0	252	0.795	1.59	11.2	22.5	2.5	5.1	252.0	504	16.5	33
Yolk	1 med.	17	52.4	308	0.719	4.23	8.8	52.0	2.2	12.9	253.3	1490	—	—
White	1 med.	31	67.3	217	0.043	0.14	2.2	7.0	0.2	0.6	0.6	2	—	—
Milk														
Whole	1 c.	244	87.8	36	0.756	0.31	11.5	4.7	1.5	0.6	36.6	15	31.7	13
Evaporated reconstituted	1 c.	244	53.7	22	0.805	0.33	11.0	4.5	1.7	0.7	36.6	15	—	—
Non-fat dry reconstituted	1 c.	244	80.5	33	0.830	0.34	8.3	3.4	0.5	0.2	25.4	10.4	—	—
Fats, Oils, and Oily Foods														
Butter	1 Tbsp.	14	—	—	—	—	—	—	—	—	0.7	5	—	—
Lard	1 Tbsp.	14	—	—	—	—	—	—	—	—	0.7	5	—	—
Margarine	1 Tbsp.	14	—	—	—	—	—	—	—	—	0.7	5	—	—
Vegetable oils	1 Tbsp.	14	—	—	—	—	—	—	—	—	0.7	5	—	—

*Data from Cheldelin and Williams (26), as only data available, even though they may not be comparable to figures obtained by other methods. Figures which are appreciably lower than other values available for similar types of foods are enclosed in parentheses.

†Dashes indicate that no representative value was found in the literature for particular constituent.

TABLE I, continued

FOOD	PORTION		VITAMIN B_6		PANTOTHENIC ACID		BIOTIN		FOLIC ACID		CHOLINE		INOSITOL	
	Amt.	Wt.	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent
Fruits														
		gm.	*mcg.*		*mg.*		*mcg.*		*mcg.*		*mg.*		*mg.*	
Fruits, fresh or frozen														
Apples, medium	1	130	39.0	30	0.130	0.10	1.2	0.9	2.6	2.0	—	—	31.2	24
Apricots	3 med.	100	71.0	71	0.290	0.29	—	—	3.3	3.3	—	—	—	—
Bananas	1 med.	100	320.0	320	0.310	0.31	4.4	4.4	9.7	9.7	—	—	34.0	34
Berries														
Blackberry	⅔ c.	100	—	—	0.260	0.26	—	—	13.7	13.7	—	—	—	—
Blueberry	⅔ c.	100	91.0	91	0.120	0.12	—	—	8.0	8.0	—	—	—	—
Raspberry, sweetened	¾ c.	100	38.0	38	0.210	0.21	—	—	5.0	5.0	—	—	—	—
Strawberry, sweetened	⅔ c.	100	61.0	61	0.160	0.16	4.0	4.0	9.0	9.0	—	—	60.0	60
Cantaloupe, diced	⅔ c.	100	36.0	36	0.260	0.26	3.1	3.1	6.8	6.8	—	—	120.0	120
Cherries, sour red, pitted	⅔ c.	100	85.0	85	0.070	0.07	—	—	6.0	6.0	—	—	—	—
Figs, small	3	114	148.2	130	0.388	0.34	—	—	16.0	14.0	—	—	—	—
Grapefruit, small	½	120	25.0	21	0.288	0.24	3.6	3.0	3.4	2.8	—	—	180.0	150
Grapes, 1 bunch	3½ oz.	100	85.0	85	0.050	0.05	1.6	1.6	5.2	5.2	—	—	—	—
Oranges, small	1	100	31.0	31	0.220	0.22	1.9	1.9	5.1	5.1	—	—	210.0	210
Peaches, sweetened	½ c.	100	20.0	20	0.120	0.12	1.7	1.7	4.0	4.0	—	—	96.0	96
Pineapple	3½ oz.	100	75.0	75	0.170	0.17	—	—	6.0	6.0	—	—	—	—
Rhubarb, sweetened	3½ oz.	100	29.0	29	0.070	0.07	—	—	4.0	4.0	—	—	—	—
Watermelon, diced	1 c.	150	49.5	33	0.450	0.30	5.4	3.6	0.9	0.6	—	—	96.0	64
Fruits, canned														
Apricots	½ c.	125	67.5	54	0.125	0.10	—	—	0.6	0.5	—	—	—	—
Blackberries	½ c.	125	30.0	24	0.100	0.08	—	—	17.5	14.0	—	—	—	—
Blueberries	½ c.	125	48.7	39	0.087	0.07	—	—	5.2	4.2	—	—	—	—
Cherries, sweet	½ c.	125	196.2	157	0.150	0.12	—	—	3.7	3.0	—	—	—	—
Peaches	½ c.	125	28.8	23	0.088	0.07	0.3	0.2	0.6	0.5	—	—	—	—
Pineapple	½ c.	125	88.7	71	—	—	—	—	1.0	0.8	—	—	—	—
Plums, purple	½ c.	125	33.7	27	0.100	0.08	—	—	1.2	1.0	—	—	—	—
Fruit, dried														
Apricots, small	6 halves	30	—	—	0.225	0.75	—	—	1.4	4.7	—	—	—	—
Dates, pitted	5	45	—	—	0.351	0.78	—	—	11.1	24.7	—	—	—	—
Figs, large	2	40	128.0	320	0.208	0.52	—	—	12.8	32.0	—	—	—	—
Prunes	5 med.	35	—	—	0.126	0.36	—	—	1.9	5.4	—	—	—	—
Raisins, seedless	3 Tbsp.	30	98.0	327	0.030	0.10	1.4	4.5	3.0	10.0	—	—	36.0	120
Fruit Juices														
Canned fruit juice														
Apple	½ c.	120	42.0	35	—	—	—	—	0.2	0.2	—	—	—	—
Grapefruit	½ c.	120	15.6	13	0.204	0.17	1.0	0.8	2.3	1.9	—	—	120.0	100
Lemon	½ c.	120	61.2	51	—	—	—	—	0.2	0.2	—	—	—	—
Orange	½ c.	120	28.8	24	0.156	0.13	1.0	0.8	2.8	2.3	—	—	169.0	141
Pineapple	½ c.	120	115.2	96	0.120	0.10	—	—	1.1	0.9	—	—	—	—
Frozen or fresh														
Apple	½ c.	120	36.0	30	0.024	0.02	0.5	0.4	1.8	1.5	0.7	0.6	28.8	24
Grape	½ c.	120	25.2	21	0.048	0.04	0.4	0.3	3.6	3.0	—	—	—	—
Grapefruit	½ c.	120	16.8	14	0.192	0.16	0.8	0.7	1.6	1.3	—	—	120.0	100
Lemon, single	½ c.	120	46.8	39	0.108	0.09	—	—	1.2	1.0	—	—	—	—
Orange, fresh	½ c.	120	31.2	26	0.168	0.14	0.4	0.3	2.6	2.2	14.4	12	141.6	118
Orange, frozen	½ c.	120	26.4	22	0.168	0.14	0.4	0.3	2.6	2.2	14.4	12	110.4	92
Pineapple	½ c.	120	88.8	74	0.144	0.12	—	—	1.2	1.0	—	—	—	—
Legumes														
	cooked	*dry*												
Mung bean	½ c.	32	182.4	570	0.800	2.50	2.4	7.5	46.4	145	66.9	209	22.4	70
Cowpeas	½ c.	32	(67.2)	(210)	0.397	1.24	6.7	21.0	140.5	439	82.2	257	76.8	240
Garbanzos	½ c.	32	172.8	540	0.400	1.25	3.2	10.0	40.0	125	78.4	245	76.8	240
Lentils	½ c.	32	156.8	490	0.480	1.50	4.2	13.2	34.2	107	71.4	223	41.6	130
Lima beans	½ c.	32	176.0	550	0.416	1.30	3.1	9.8	41.0	128	—	—	54.4	170
Navy beans	½ c.	32	—	—	0.387	1.21	—	—	40.0	125	—	—	160.0	500
Kidney beans	½ c.	32	—	—	0.208	0.65	—	—	57.6	180	—	—	—	—
Split peas	½ c.	32	105.0	328	0.700	2.18	5.9	18.4	16.3	51	64.3	201	48.0	150
Soy beans	½ c.	32	204.8	640	0.538	1.68	19.5	61.0	71.7	224	108.8	340	64.0	200
Soy flour	1 c.	90	590.4	656	1.512	1.68	63.0	70.0	383.4	426	202.5	225	184.5	205
Meat and Poultry‡														
Beef														
Ground	3½ oz.	100	460.0#	460	0.440#	0.44	—	—	6.9	6.9	—	—	—	—
Liver	2 oz.	57	378.5	664	5.324	9.34	54.7	96.0	167.6	294.0	290.7	510	29.1	51
Rib roast, lean	3 oz.	100	480.0#	480	0.600#	0.60	3.4	3.4	—	—	82.0	82	—	—
Round	3 oz.	100	495.0#	495	0.520#	0.52	2.6	2.6	10.5	10.5	68.0	68	11.5	11.5

‡Raw values, except where indicated. #Cooked values

TABLE I, continued

FOOD	PORTION		VITAMIN B_6		PANTOTHENIC ACID		BIOTIN		FOLIC ACID		CHOLINE		INOSITOL	
	Amt.	Wt.	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent
Meat and Poultry, concluded‡														
		gm.	*mcg.*		*mg.*		*mcg.*		*mcg.*		*mg.*		*mg.*	
Lamb														
Leg	3 oz.	100	320.0#	320	0.620#	0.62	5.9	5.9	3.3	3.3	84.0	84	58.0	58
Liver	2 oz.	57	—	—	4.047	7.10	72.4	127.0	157.3	276.0	—	—	—	—
Loin chop	3 oz.	100	330.0#	330	0.590#	0.59	—	—	—	—	76.0	76	—	—
Veal														
Chop	3½ oz.	100	430.0#	430	0.550#	0.50	2.0	2.0	—	—	96.0	96	33.0	33
Leg	3½ oz.	100	200.0	200	0.914	0.914	—	—	—	—	132.0	132	—	—
Shoulder	3½ oz.	100	300.0	300	—	—	—	—	—	—	93.0	93	—	—
Stew meat	3½ oz.	100	330.0	330	0.852	0.852	—	—	4.6	4.6	96.0	96	—	—
Pork														
Bacon	2 sl.	16	88.0#	550	0.070#	0.440	1.2	7.6	—	—	12.8	80	6.9	43
Ham	3½ oz.	100	440.0#	440	0.640#	0.640	5.0	5.0	10.6	10.6	122.0	122	31.0	31
Liver	2 oz.	57	—	—	3.994	7.008	57.0	100.0	126.0	221.0	314.6	552	—	—
Loin	3½ oz.	100	480.0#	480	0.400#	0.400	5.2	5.2	2.4	2.4	77.0	77	45.0	45
Poultry														
Chicken														
Dark meat	3½ oz.	100	(25.0)	(25)	0.692	0.692	10.0	10.0	2.8	2.8	—	—	47.0	47
White meat	3½ oz.	100	(130.0)	(130)	0.804	0.804	11.3	11.3	3.0	3.0	—	—	48.0	48
Turkey	3½ oz.	100	—	—	0.748	0.748	—	—	7.5	7.5	—	—	—	—
Bologna, A.P.	2 oz.	57	—	—	—	—	—	—	—	—	34.2	60	—	—
Frankfurter. A,P,	1	50	65.0	130	0.212	0.425	—	—	—	—	28.5	57	—	—
Sausage, pork, A.P.	2 oz.	57	108.3	190	0.321	0.563	—	—	6.5	11.5	27.4	48	—	—
Fish														
Halibut, canned	3½ oz.	100	(110.0)	(110)	0.150	0.150	8.0	8.0	—	—	—	—	17.0	17
Mackerel, Pacific, canned	3½ oz.	100	270.0	270	0.470	0.470	18.0	18.0	0.6	0.6	—	—	—	—
Salmon, canned	3½ oz.	100	450.0	450	0.580	0.580	15.0	15.0	0.5	0.5	—	—	17.0	17
Tuna, canned	3½ oz.	100	670.0	670	0.420	0.420	3.0	3.0	1.8	1.8	—	—	—	—
Sardines, Pacific, canned	3½ oz.	100	280.0	280	0.600	0.600	24.0	24.0	0.5	0.5	—	—	—	—
Shellfish, canned														
Clams	3½ oz.	100	83.0	83	0.590	0.590	—	—	2.0	2.0	—	—	—	—
Crabs	3½ oz.	100	364.0	364	—	—	—	—	0.4	0.4	—	—	—	—
Oysters	3½ oz.	100	37.0	37	0.490	0.490	8.7	8.7	11.3	11.3	—	—	44.0	44
Shrimp	3½ oz.	100	111.0	111	0.210	0.210	—	—	1.8	1.8	—	—	—	—
Nuts and Oily Fruits														
Nuts, raw														
Almonds	12-15	15	15.0	100	0.087	0.578	2.7	18.0	6.7	45.0	—	—	—	—
Brazil nuts	2 med.	15	—	—	0.035	0.231	—	—	0.7	4.5	—	—	—	—
Cashews	6-8	15	—	—	0.174	1.62	—	—	—	—	—	—	—	—
Coconut, fresh	½ oz.	15	—	—	0.049	0.330	—	—	4.1	27.6	—	—	—	—
Filbert	10-12	15	—	—	0.172	1.146	—	—	10.0	66.6	—	—	—	—
Peanuts, roasted	15-17	15	45.0	300	0.320	2.137	5.1	34.0	8.5	56.5	24.3	162	27.0	180
Pecan halves	12	15	—	—	0.256	1.707	4.0	27.0	4.0	27.0	7.5	50	—	—
Walnut halves	8-15	15	144.0	960	0.146	0.970	5.5	37.0	11.5	77.0	—	—	—	—
Peanut butter	1 Tbsp.	16	48.0	300	0.400	2.500	6.2	39.0	8.5	56.5	23.2	145	28.8	180
Fruits, oily														
Avocado, Fuerte (cubed)	½ c.	75	457.5	610	0.675	0.90	4.1	5.5	22.5	30.0	—	—	—	—
Olive, ripe, mammoth	6	40	6.4	16	0.008	0.02	—	—	0.3	0.7	—	—	—	—
Vegetables														
Vegetables, fresh or frozen														
Asparagus	3½ oz.	100	136.0	136	0.620	0.62	—	—	109.0	109.0	10.0	10.0	—	—
Beans, Lima	3½ oz.	100	170.0	170	0.450	0.45	—	—	34.0	34.0	—	—	—	—
Beans, snap, green	3½ oz.	100	63.0	63	0.200	0.20	—	—	27.5	27.5	42.0	42.0	—	—
Beets (diced)	⅔ c.	100	(37.0)	(37)	0.170	0.17	1.9	1.9	13.5	13.5	—	—	21.0	21
Broccoli	⅔ c.	100	171.0	171	1.290	1.29	—	—	53.5	53.5	—	—	—	—
Brussels sprouts	3½ oz.	100	162.0	162	0.720	0.72	—	—	49.0	49.0	—	—	—	—
Cabbage (fine shreds)	1 c.	100	120.0	120	0.260	0.26	2.4	2.4	32.3	32.3	23.0	23.0	95.0	95
Carrots (grated)	½ c.	55	66.0	120	0.150	0.27	1.4	2.5	4.4	8.0	7.0	13.4	26.4	48
Cauliflower (buds)	1 c.	100	177.0	177	1.010	1.01	17.0	17.0	22.2	22.2	—	—	95.0	95
Celery (diced)	1 c.	100	—	—	0.430	0.43	—	—	7.0	7.0	—	—	—	—
Corn	3½ oz.	100	222.0	222	0.890	0.89	6.0	6.0	28.0	28.0	—	—	—	—
Lettuce	¼ hd.	100	(71.0)	(71)	0.360	0.36	3.1	3.1	21.0	21.0	—	—	55.0	55
Mixed vegetables	3½ oz.	100	122.0	122	0.310	0.31	—	—	16.0	16.0	—	—	—	—
Onion (2½ in.)	1	110	(69.3)	(63)	0.187	0.17	3.8	3.5	11.0	10.0	—	—	96.8	88
Peas, cow	3½ oz.	100	118.0	118	0.400	0.40	21.0	21.0	41.0	41.0	97.0	97.0	240.0	240
Peas, green	3½ oz.	100	150.0	150	0.820	0.82	9.4	9.4	25.0	25.0	75.0	75.0	162.0	162
Potatoes, peeled	1 med.	100	220.0	220	0.400	0.40	—	—	6.8	6.8	29.0	29.0	29.0	29
Potatoes, sweet	½ med.	100	320.0	320	0.930	0.93	4.3	4.3	12.0	12.0	11.5	11.5	66.0	66

‡Raw values, except as indicated. #Cooked.

TABLE I, concluded

FOOD	PORTION		VITAMIN B_6		PANTOTHENIC ACID		BIOTIN		FOLIC ACID		CHOLINE		INOSITOL	
	Amt.	Wt.	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent	Wt.	Per cent
Vegetables, Concluded														
		gm.	*mcg.*		*mg.*		*mcg.*		*mcg.*		*mg.*		*mg.*	
Squash, winter	3½ oz.	100	91.0	91	0.490	0.49	—	—	12.0	12.0	—	—	—	—
Squash, yellow	3½ oz.	100	63.0	63	0.390	0.39	—	—	17.0	17.0	—	—	—	—
Tomato	1 small	110	—	—	0.341	0.31	4.4	4.0	8.8	8.0	—	—	50.6	46
Mushrooms, fresh	2 oz.	60	(27.0)	(45)	1.626	2.71	9.6	16.0	14.4	24.0	—	—	10.2	17
Greens														
Beet	3½ oz.	100	—	—	0.260	0.26	2.7	2.7	60.0	60.0	—	—	21.0	21
Kale	3½ oz.	100	185.0	185	1.290	1.29	—	—	70.0	70.0	—	—	—	—
Mustard	3½ oz.	100	133.0	133	0.250	0.25	—	—	60.0	60.0	22.0	22.0	—	—
Spinach	3½ oz.	100	198.0	198	0.310	0.31	6.9	6.9	75.0	75.0	22.0	22.0	27.0	27
Turnip	3½ oz.	100	98.0	98	0.380	0.38	—	—	42.0	42.0	27.0	27.0	46.0	46
Vegetables, canned with liquid														
Asparagus, green	½ c.	120	90.0	75	0.240	0.20	2.0	1.7	32.4	27.0	—	—	—	—
Beans														
Lima	½ c.	120	97.2	81	0.132	0.11	—	—	15.6	13.0	—	—	—	—
Green string	½ c.	120	51.6	43	0.084	0.07	1.5	1.3	14.4	12.0	—	—	—	—
Beets (diced)	½ c.	125	67.5	54	0.125	0.10	—	—	3.5	2.8	—	—	—	—
Carrots (diced)	½ c.	125	51.2	41	0.137	0.11	1.9	1.5	4.1	3.3	—	—	—	—
Corn	½ c.	125	270.0	216	0.275	0.22	2.7	2.2	9.6	7.7	—	—	—	—
Mushrooms	½ c.	120	75.6	63	1.128	0.94	8.7	7.3	4.7	3.9	—	—	20.4	17
Peas														
Cow	½ c.	125	66.2	53	—	—	—	—	32.5	26.0	—	—	—	—
Green	½ c.	125	55.0	44	0.212	0.17	2.6	2.1	12.9	10.3	—	—	—	—
Spinach	½ c.	120	114.0	95	0.071	0.059	2.8	2.3	58.8	49.0	—	—	—	—
Tomatoes	½ c.	120	181.2	151	0.276	0.23	2.2	1.8	4.4	3.7	—	—	—	—
Tomato juice	½ c.	120	230.4	192	0.360	0.30	—	—	8.0	6.7	—	—	—	—
Miscellaneous														
Chocolate	1 oz.	28.4	(6.5)	(23)	0.054	0.19	9.0	32.0	28.1	99.0	—	—	24.1	85
Molasses	1 Tbsp.	20	(54.0)	(270)	0.092	0.46	1.8	9.0	1.9	9.5	17.2	86	30.0	150
Yeast, brewer's	1 Tbsp.	8	193.5	2419	0.880	11.0	16.0	200.0	161.8	2022.0	19.2	240	—	—
Food yeast, torula	1 Tbsp.	8	280.0	3500	0.800	10.0	8.0	100.0	240.0	3000.0	20.0	250	21.6	270
Honey	1 Tbsp.	20	2.0	10	0.012	0.06	—	—	0.6	3.0	—	—	—	—
Pollen, flower	—	1	9.0	900	0.027	2.70	0.3	25.0	—	—	—	—	—	—
Royal jelly	—	1	10.2	1020	0.320	32.00	4.1	410.0	0.5	50.0	—	—	0.1	10
Dairy Food Substitutes														
Soybean milk, commercial type														
Soyagen: infant, all-purpose, or malt-flavored powder	—	30	52.5	185.0	0.25	0.870	3.4	11.90	6.6	23.34	—	—	32.2	11.30
Reconstituted liquid	1 c.	240	57.5	24.0	0.27	0.112	3.7	1.54	7.2	3.00	—	—	35.3	1.47
Soyalac, infant, concentrated, liquid, reconstituted	1 c.	240	72.5	30.0	0.178	0.074	3.28	1.37	27.50	11.46	—	—	22.75	9.48
Prepared Plant Protein														
Gluten-type entrées														
Choplets	2 oz.	60	54.0	90.0	0.048	0.080	7.7	12.8	17.0	28.5	6.0	10.0	3.5	5.8
Dinner Cuts	2 oz.	60	36.0	60.0	0.032	0.054	3.0	5.0	13.2	22.0	9.5	12.5	3.0	5
Vegeburger	2 oz.	60	53.4	89.0	0.036	0.060	3.6	6.0	15.0	25.0	6.0	10.0	3.0	5
Weighted average‡	2 oz.	60	46.2	77.0	0.036	0.060	4.2	7.0	14.7	24.5	6.6	11.0	3.2	5.3
Nutmeat-type entrées														
Linketts	2 oz.	60	55.8	93.0	0.100	0.164	5.7	9.5	22.2	37.0	7.2	12.0	6.0	10
Nuteena	2 oz.	60	25.8	43.0	0.121	0.202	22.8	38.0	52.8	88.0	11.4	19.0	6.0	10
Patties	2 oz.	60	39.6	66.0	0.021	0.035	2.4	4.0	76.2	127.0	48.0	80.0	40.8	68
Proteena	2 oz.	60	43.2	72.0	0.125	0.208	13.2	22.0	19.2	32.0	6.9	11.5	6.6	11
Vegalinks	2 oz.	60	42.0	70.0	0.016	0.026	4.2	7.0	42.3	70.5	18.0	30.0	16.8	28
Weighted average‡	2 oz.	60	45.4	76.0	0.112	0.186	9.3	15.3	34.2	57.0	12.3	20.5	10.0	16.8

‡Weighted on the basis of sales per product per year.

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Breaded Shrimp

Americans consume 61,000,000 lb. breaded shrimp annually, of which, some 35 per cent is used in the institutional field, according to an estimate of the National Shrimp Breaders Association.

Producers may take advantage of the Department of Interior's voluntary grading service, a plan by which government inspectors grade the products at the plant. To belong to the National Shrimp Breaders Association, a processor must permit continuous government inspection in his plant and carry the "U.S. Grade A" seal on his package. According to this standard, the product must score not less than 85 points on a scale set up by the government, and the breading must not be more than 50 per cent of the weight.

Health Mobilization and the Dietitian[1]

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IN JULY 1958, the national civil defense structure was strengthened by a federal reorganization, culminating in the creation of the Office of Civil and Defense Mobilization (OCDM) in the Executive Office of the President. Three months later, the Director, the Honorable Leo Hoegh, presented, with President Eisenhower's blessing, a milestone in nonmilitary defense for this country: the National Plan for Civil Defense and Defense Mobilization.

The National Plan takes into consideration three contingencies: increased international tension, limited hostilities (e.g., Korea), and general warfare. Generally speaking, the greater the action, the more complete will be nationwide mobilization.

In broad terms, three activities are essential immediately after general war ensues:

(a) Defensive and retaliatory action by the Armed Forces.

(b) Maintenance and/or re-establishment of governmental authority.

(c) Provision of supplies, equipment, and manpower for life-saving and survival programs.

Besides the basic National Plan, a number of "annexes" have been published on specific programs, e.g., Annex 7, "Role of the Military," and Annex 18, "The National Health Service."

Annex 2 of the National Plan points out that individuals and families must provide the necessities for their own survival for a minimum of two weeks following attack. Beyond that, each local and state government is expected to be self-sufficient for at least thirty days.

These requirements apply equally to food, potable water, and medical survival items.

Such standards become apparent when one studies the pattern of possible thermonuclear attacks, wherein he finds that the hazards of external radiation may effectively isolate large segments of our population. In isolated circumstances, disruption of communications and transportation put a premium for survival on individuals and communities who have prepared for the worst.

Civil Defense and the Food Effort

The over-all responsibility for direction and coordination of the national food program is vested in the Department of Agriculture. This Department's efforts, however, are assisted by the Department of Interior for fish and fishery products, and by the Department of Health, Education, and Welfare, which certifies to the safety, purity, and wholesomeness, except of those things in which Agriculture obviously has more interest; e.g., meats and agricultural commodities.

Claimancy for foods, as for other supplies, may assume considerable importance. The needs of five different agencies will have to be weighed and adjudicated:

(a) Department of Defense, for the military services.

(b) Department of the Interior, for Puerto Rico and the possessions and territories.

(c) State Department, for foreign areas.

(d) Department of Commerce, for industrial uses.

(e) Department of Agriculture, for civilians and farms.

The Emergency Welfare Service will be responsible for providing financial and social welfare assistance; for registering of all citizens (both living and dead), and supplying information about them; for emergency housing; for clothing; and for disaster feeding.

Disaster feeding is no mean task. There must be methods for determining the caloric requirements of large groups of people. Mobile teams must be organized and equipped. Food must be prepared and

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 20, 1960.

served in emergency community kitchens, mass feeding centers, or congregate lodgings under circumstances far different from what we expect in today's culture. Consider, if you will, how we have become accustomed to potable water coming from the faucet; the flush toilet; garbage "disposals"; processed foods; and walk-in refrigerators. Only the occasional picnic, diarrhea, or a visit to a foreign country alerts us to the high sanitation standards this country enjoys.

Special feeding requirements must be considered for infants and very young children, for expectant mothers, for the aged and chronically ill. For some time, an arbitrary limit of two years was accepted as the termination of infancy; but more recently, I understand, eighteen months is now recommended.

It goes without saying that austerity will wipe out many of the culinary frills—high-vitamin diets, for instance—which dietitians have provided for us physicians for many years.

SHELTER DIETS

Most recent experiences with shelter feeding have been with 2000-calorie diets, principally of one-dish meals. Because heat is a problem in closed spaces, cold food has been preferred, even when burners for cooking are available.

During the post-attack "button up" period, large segments of our population will be required to exist in fallout shelters. To prepare for this day, much study is underway with respect to shelter diets. All the answers are not in, but some general principles have been reached. Shelter foods must be stable, so that inspections can be infrequent and rotation kept to a minimum. They must be inexpensive, so that initial and replacement costs are minimal. The smallest possible number of food items should be warehoused, so that inspection will be easier and less frequent, and fewer samples will be required for study. At present-day prices, it has been estimated that only one inspection of a shelter food stockpile consisting of twenty-eight different canned one-dish meals, plus soluble coffee, non-fat dry milk, and crackers, would cost $300. Keeping humidity as low as 65 per cent protects the packages from moisture damage, thereby prolonging shelf-life.

Another interesting study is that on bulgur, a product first introduced into Europe by the Mongol armies. As used in the present-day investigations, it is a dry granular product expanded by heat from partially debranned wheat. This bulgur, prepared in wafer form, can be eaten as a cracker, with or without jelly or a spread; in crumbled form with milk as a breakfast cereal; or as a main course, covered with a hot sauce or gravy. It has been employed as a potato or rice substitute and as a soup additive.

Now that we have briefly reviewed the present-day feeding situation, let us turn to health services post-attack, and our preparations for that day.

The Health Structure and Civil Defense

The major problems that the Emergency Health Service can foresee post-attack are:

(a) A marked disparity between the resources that remain, and the requirements for these resources in casualty and non-casualty care.

(b) Radiation fallout may interdict prompt response and rescue, besides creating additional casualties.

(c) The possible addition of biologic and chemical warfare agents.

Additional problems which must be considered as complications which will further increase mortality and morbidity are:

(a) Destruction of water systems.
(b) Denial of normal sewage systems.
(c) Loss of essential health services.
(d) Lack of shelter, clothing, and fuel.
(e) Increased insects and rodents.
(f) Overcrowding and inadequate food.
(g) Psychologic effects leading to panic, apathy, or non-cooperation.

You probably know that each year we have an Operation Alert, during which there is relocation of governmental elements. In these war "games" (what a horrible word!), attacks on target areas of the continental United States are assumed, as the National Damage Assessment Center draws conclusions on our ability to survive and retaliate. Some Operations have demonstrated total casualties (dead and injured) as high as 60 million, including one-third of the physicians, dentists, and nurses. If some of us have been unable to get a doctor when we needed one, consider how much more serious is the situation when the ratio of patients to physicians is multiplied tenfold.

In coping with the tremendous manpower deficit, the Division of Health Mobilization considers these immediate goals of paramount importance:

(a) Developing in the civilian population a capability to meet its own medical needs through self-help and neighbor help.

(b) Stockpiling supplies, equipment, and facilities in protected sites where they will be immediately available for emergency use.

(c) Developing operational plans, following a realistic assessment of the probable post-attack situation.

(d) Mobilizing, organizing, and training all types of health personnel.

In the more distant future, we have secondary goals, such as the re-establishment of research and teaching programs, but these must be laid aside temporarily while more pressing problems are solved.

Space limitations prevent a full discussion of these four goals, although I am happy to report some over-all progress. In the Self-Help Program, a training program is now being field tested in Atlanta, and a draft manual of survival medical care has been prepared. The Division of Health Mobilization hopes to publicize both of these shortly. The development of realistic operational plans and improvement of the stockpile program are not as far along as we might like, but we are hopeful that additional budgetary support will soon be available.

TRAINING FOR MOBILIZATION

I would like to discuss at greater length training, for we feel that training for mobilization is exceedingly important. Under delegation and policy guidance from OCDM, the Division of Health Mobilization had three courses in health mobilization in the spring of 1960—in Brooklyn, Battle Creek, and Alameda, California. More than 250 people participated, from a wide spectrum of the health professions—physicians (including osteopaths), dentists, nurses, sanitarians, veterinarians, health department officials, and hospital administrators. These five-day courses included a present-day briefing on our national defense stature; the rudiments of radiologic, chemical, and biologic warfare; and an intensive review on instructional methods to be taken back to the student's community. Included among these methods were:

(a) Use of moulages for the simulation of casualties for first aid teaching.

(b) Exercise in assembly and operation of the 200-bed Civil Defense Emergency Hospital.

(c) Management of an epidemiologic problem.

(d) Decision-making sessions in a civil defense emergency.

Four more such courses are planned. One was held in December, 1960 for hospital administrators, in Brooklyn; two are scheduled in April for nurses and sanitarians, in Battle Creek; and one "baseline" course for other health personnel in May in Battle Creek. Information and application forms are available through the civil defense organization.

The Dietitian in the Total Civil Defense Effort

You might ask, does this have relationship to me? It does!

With feeding services reduced to the austerity situation we mentioned above, dietitians may wish to offer their services in another capacity. The dietitian who can adapt her professional experience to use in helping casualties would be making a significant contribution.

Before you tell me, "I have no experience" or "I am afraid of the sight of blood" or "I am all thumbs, I couldn't tie a bandage," I would remind you of the extreme health skill shortage we may expect.

A few years ago this problem of professional disparity was presented to a group of national organizations under the leadership of the American Medical Association. After lengthy study, they broke down all the categories of casualty management and recommended that expanded responsibilities be given to all health personnel after a period of training: For dietitians, the following have been suggested:

(a) First aid, including treatment of shock, control of hemorrhage, artificial respiration.

(b) Attainment and maintenance of an open airway in the throat.

(c) Cleansing and treating wounds.

(d) Bandaging and splinting.

(e) Assisting in management of emotionally disturbed.

These are grave responsibilities, but then, we anticipate grave times.

Nor are these the only areas where you can help. Hospital dietitians can work effectively with their superintendents, who also are preparing survival plans. The hospital administrator has a responsibility for gearing his institution's plan into that of the community. In so doing, he will undoubtedly want a continuing inventory of his food supply. Having been given his expanded bed capacity (as much as ten times normal) by the civil defense coordinator, he will need to help in preparing preattack plans for feeding them. He should have available for almost immediate use estimates of the kinds and amounts of food items he should requisition from the Feeding Service if and when an all-out disaster occurs. He will undoubtedly need your advice on emergency sanitation methods and provision for large amounts of potable water.

Speaking of sanitation, one suggestion I have heard is: with the extreme shortage of sanitarians we can expect post-attack, dietitians have the ideal background to be of assistance in this field.

Dietitians can be of tremendous assistance to those in the welfare services who are responsible for disaster feeding. Instructors are needed in sizeable numbers. Pocket manuals, instructor's guides, and film strips are available. The Office of Civil and Defense Mobilization, the Department of Health, Education, and Welfare, and the American Red Cross have worked closely in this training program, and I strongly commend it to you.

As Governor Hoegh has so aptly stated: "Civil Defense is you."

In 40 B.C., a Roman innkeeper named Segius Locates served a special meal for ship brokers too busy to return to their villas. He is thus credited with creating the first "businessman's lunch."

Biologic Warfare and Its Effects on Foods[1]

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THE THREAT of biologic warfare should be of serious concern to The American Dietetic Association. The greatest threat of this form of warfare may not lie in its capacity to kill people but, rather, in the destruction of the economy through incapacitating the working force and destroying crops and domestic animals. The reduction of the national food supply or specific portions of it and the possibility of contaminating food in storage or during processing should be of grave concern to your organization. You have a unique technical competence and experience which requires you to provide leadership for dealing with certain defensive aspects of this problem.

It will be useful to describe some of the general aspects of biologic warfare as a conceptual background for your planning. Those aspects that are of particular interest to your organization will be emphasized.

Agents for Biologic Warfare

One of the major considerations, of course, involves the character and properties of agents that might be used. Only relatively few microorganisms possess the characteristics that meet the special criteria for inclusion in an arsenal of agents; some of these characteristics are:

(a) The agent must be highly infectious. Judgment as to possession of this characteristic is based on a variety of evidence, principally medical and epidemiologic. Very convincing evidence is suggested, of course, in the case of agents which frequently cause infection in laboratory workers.

(b) The agent must have sufficient viability and virulence stability to meet minimal logistic requirements. It is believed that techniques for improving this property may result from appropriate research. This property would be of grave concern with respect to contamination of food and food products.

(c) The agent must be capable of being produced on a militarily significant scale.

(d) The agent should not be unduly injured by dissemination in the field, and it should have a minimum decay rate in the aerosol state.

(e) There should be a minimal immunity in the target population.

Obviously, many microbiologic agents do not meet these basic requirements.

There are certain military characteristics, also, that should be kept in mind. Agents could be selected for the purpose of accomplishing a particular mission. In other words, an enemy might use lethal agents or agents that may cause varying degrees of incapacity.

Methods of Attack

The creation of a cloud or aerosol of an agent over an area is believed to be one of the most likely methods of attack. This concept has stimulated much research concerning the behavior and properties of small particles containing viable microorganisms. A major contribution of this research has been the demonstration of the importance of particle size in the initiation of infection. The natural anatomic and physiologic features of the upper respiratory tract, such as the turbinates of the nose and the cilia of the trachea and larger bronchi, are capable of impinging out the larger particles to which we are ordinarily exposed in our daily existence. Very small particles, in a size range of 1 to 5 microns in diameter, are capable of passing these impinging barriers and entering the alveolar bed of the lungs—an area that is highly susceptible to infection.

We are primarily interested in the strategic aspects of this weapon as a guide to our planning for civil defense. The possibility of creating a cloud or aerosol of biologic agent over a large target area was shown in some field trials described previously (1). These trials suggested the feasibility of cover-

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 20, 1960.

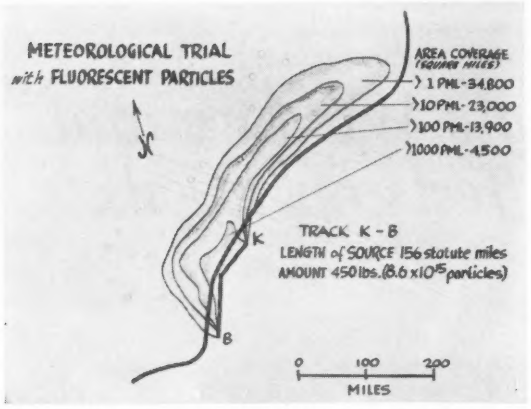

FIG. 1. *Results of dissemination trial with 2-micron particles of zinc cadmium sulfide released 10 mi. offshore for a distance of 156 mi. PML = total particles collected at a sampling rate of 1 liter air per minute. These figures, multiplied by the breathing rate, i.e., 15 liters per minute, would indicate the inhaled dose.*

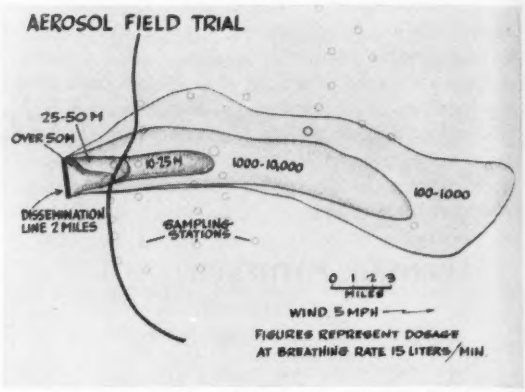

FIG. 2. *Behavior of biologic cloud, aerosolized along a 2-mi. course 2 mi. offshore.*

ing extensive target areas—areas of thousands of square miles. It will be useful to describe these trials here.

In the first trial, an inert substance was disseminated from a boat traveling some 10 mi. offshore under appropriately selected meteorologic conditions. Zinc cadmium sulfide, in particles of 2 microns in diameter, was disseminated by techniques developed by Perkins *et al* (2). This material fluoresces under ultraviolet light, which facilitates its sampling and assessment. Four hundred and fifty lb. were disseminated while the ship was traveling a distance of 156 mi. The results of this trial are shown in Figure 1. This aerosol traveled a maximum sampled distance of some 450 mi. and covered an area of over 34,000 sq.mi. The concentration of particles in this aerosol could have been increased by increasing the source strength, which was small in this case.

The behavior of a biologic cloud, on a much smaller scale, can be illustrated by a field trial conducted with a non-pathogenic organism. An aqueous suspension of the spores of *B. subtilis, var. niger*, generally known as *Bacillus globigii*, was "aerosolized," using commercially available nozzles. A satisfactory cloud was produced, even though these nozzles were only about 5 per cent efficient in producing an initial cloud of particles in the size range of 1 to 5 microns. In this test, 130 gal. of a suspension of spores were aerosolized. The spraying operation was conducted along a 2-mi. course from the rear deck of a small naval vessel, cruising 2 mi. offshore and vertical to an on-shore breeze. There was a slight lapse condition, a moderate fog, and 100 per cent relative humidity. A network of sampling stations had been set up on shore. The results of this trial are shown in Figure 2. This cloud was sampled for a distance of 23 mi. downwind from the source. Approximately 100 sq. mi. were covered within the area sampled. It is quite likely that an even greater area was covered, particularly downwind.

This experiment could be criticized on the basis that it was conducted with a bacterial spore which is subject to little biologic decay. In a recent trial conducted with a vegetative pathogen, on the other hand, guinea pigs were infected for a distance of 15 mi. downwind of the origin of the aerosol. Extrapolative calculations suggested that the aerosol probably traveled a good deal further than the sampled distance.

Effects of Biologic Attacks

Thus the possibility of the strategic coverage at long range of very extensive target areas is the major threat of biologic warfare to our nation. While a major problem, defensively, would be the medical care of the large number of casualties, there are certain other effects, also, that are important. In the past, some of these have not received adequate attention. Such an extensive coverage with an aerosol of an infectious agent might create several ecologic and environmental problems of great importance.

All living things in a target area would inhale the aerosol. This would involve a variety of birds and animals, both domestic and wild, and could result in some very serious consequences, in that new enzootic foci of disease might be established. For example, an aerosol of the plague bacillus might seek out rats in their burrows or squirrels in their dens. We must face the threat of military delivery of truly exotic agents, including zoonotic agents and mixtures, against our human and animal populations and against our agricultural crops. Some of these agents, such as those causing Rift Valley fever or louping ill, might be infectious for both men and animals. Others, such as the viruses of Japanese B

encephalitis and Venezuelan equine encephalomyelitis, might become established in bird or mosquito populations. We would also face the possible reintroduction of diseases that had been eliminated at great cost in the past, such as yellow fever, smallpox, and malaria of man, and pleuropneumonia, glanders, and foot and mouth diseases of animals. If such diseases were re-established, their control again might be exceedingly costly.

Geography of Contamination

An aerosol of infective particles, 5 microns or less in diameter, possesses considerable capacity for diffusing through buildings. It behaves not unlike a gas in this respect. It is quite obvious, therefore, that there would be widespread contamination throughout the target area—contamination of hospitals, food supplies, public and domestic kitchens, restaurants, warehouses, and so on. An important point should be made here. The contamination in this instance will all be *on the surface of things*, due to deposition by settling or impingement of infective particles. This is important with respect to countermeasures. The contents of canned, bottled, or carefully packaged foods would not be contaminated. It would only be necessary to sterilize the surface of such containers. This can be done by such procedures as dipping or rinsing in hypochlorite solution or some comparable disinfecting solution, or by exposure to one of the gaseous disinfectants, such as ethylene oxide, methyl bromide, or formaldehyde vapor (3-5). Large stocks could be treated in this manner, provided the procedure were conducted in a suitable enclosed space. Fresh vegetables and fruits could be treated by appropriate washing and subsequent cooking.

On the other hand, the actual *mass* of uncovered or exposed foods would be contaminated by such an aerosol. In this case, depending on the agent involved, there may even be additional multiplication in some of these contaminated products: for example, the ability of the typhoid bacillus or the dysentery group of organisms to grow in milk is well recognized. There could also be widespread contamination by organisms having a specific potential for producing spoilage.

A number of biologic agents are suitable for delivery through enemy sabotage methods. Our country possesses enormous food processing industries, including the preparation of soft drinks and the processing of milk and milk products, that are subject to this form of attack. It is important to bear in mind that in this case, in contradistinction to deposition on surfaces from an aerosol, the *bulk or mass of food would be contaminated.* This would require different procedures for sterilization. If contamination is suspected or proved, sterilization by heat would be preferred. One must be assured of penetration throughout the mass. The usual baking, boiling, and roasting procedures, if thorough, are likely to destroy vegetative bacteria and viruses. The spores of such organisms as *B. anthracis* and the clostridia, particularly *Cl. botulinum*, present a more difficult problem. Except under the direst of circumstances, it would be best to discard and destroy such foods. Certain other types of food, i.e., ice cream and butter, should be destroyed.

Antifood Attacks

The major threat for our food resources is that specific biologic warfare agents may be used for reducing or destroying agricultural crops and domestic animals—in other words, antifood biologic warfare.

In addition to providing food, some crops are of critical importance in other aspects of the economy. The fiber crops, cotton and hemp, are examples. Some industrial chemicals, such as alcohol, rubber, and certain oils, are produced from argicultural crops. Last, but not least, certain pleasure-producing crops, such as tobacco, tea, coffee, and various herbs and spices, should be mentioned. A number of important drugs, such as digitalis, opium, and quinine are also derived from specific crops.

Domestic animals contribute a fair share to the over-all economy. Extensive loss of animals might result in curtailment of proteins and animal fats, necessitating the use of substitutes which may also be in short supply. In addition to meat, dairy and poultry products, there are many other important products from the animal industry, such as draft power, transport in undeveloped areas, fertilizer (manure and bone meal), leather, wool, glue, gelatin, and various very important pharmaceuticals.

Crop-Destroying Agents

Two types of agents with very different characteristics might be used for destroying crops. One class is represented by a group of organic chemicals that act as growth-regulating hormones, such as 2,4-dichlorophenoxyacetic acid. Such substances are active in extremely small amounts. This particular compound is most active against the broad-leaved species of plants. It is manufactured on a large scale for use as a weed killer.

The chemical agents are not, of course, self-propagating and will affect only those plants to which they have been applied. On the other hand, they are more general in the variety of plants affected than is the case with the highly specific biologic agents.

The biologic anticrop agents would be the most damaging type if used on a large-area basis. Agents would be selected for their capacity to propagate. Experience with natural epiphytotics indicates that large crop areas may be covered. The spread of stem

rust of wheat up the Mississippi Valley and Great Plains area and on into Canada is a typical example. The famine in Ireland in 1846 and 1847, due to a widespread epiphytotic of late blight of potatoes, is illustrative also. Blast disease of rice has caused repeated damage to rice crops in the Orient.

Our country is in a relatively favorable defensive position in anticrop warfare. We are in the unusual position of finding overproduction of agricultural crops a major problem. As a result, we have several years' supply of most major products in storage. Our agriculture, moreover, is very diversified and biologic agents are highly specific. Successive losses, nevertheless, of a major crop could require some changes in our dietary planning and the preparation and use of substitute foods might be required.

Also, the loss of certain specialty crops, grown on a limited basis, could be embarrassing. We all remember our consternation in 1959 over the "cranberry episode."

Our position with respect to anti-animal agents is critical. Our livestock populations are highly susceptible to the major plagues, most of which are exotic with respect to this country. Introduction of these agents could be devastatingly serious. The Department of Agriculture is devoting scrupulous attention to this problem.

Summary

This, then, is the threat of biologic warfare. Your own professional competence should be employed in defensive planning to deal with the following major possibilities:

(a) Widespread destruction on the farm of specific crops and/or livestock and poultry. This may require detailed planning for use of substitutes to meet not only an adequate caloric need, but that for the other essential nutritional substances.

(b) Widespread contamination, by deposition from an aerosol, of food, food products, or unprocessed raw materials with either specific infectious agents and/or organisms having a potential for causing spoilage. The likelihood of damage to properly canned, bottled, or packaged foods is not great, although the exposed surfaces of such containers may require sterilization.

(c) The direct contamination of the mass of food during processing and prior to canning, bottling, or packaging. This would require sterilization of the bulk food itself, if practical.

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(3) PHILLIPS, C. R.: Gaseous Sterilization. Lecture at Seton Hall College of Medicine and Dentistry, February 25, 1958. (Published by Becton, Dickinson & Co.)

(4) KAYE, S.: The sterilization action of gaseous ethylene oxide. 3. The effect of ethylene oxide and related compounds upon bacterial aerosols. Am. J. Hyg. 50: 289, 1949.

(5) KAYE, S.: The use of ethylene oxide for the sterilization of hospital equipment. J. Lab. & Clin. Med. 35: 823, 1950.

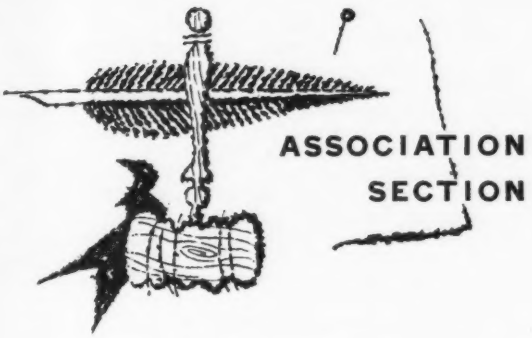
Fire Precautions

Headlines recently reminded food service operators that grease chute fires can be a bother if one is so fortunate as to prevent such a fire from totally destroying the establishment. This problem area was reviewed during the 1960 Safety Congress of the National Safety Council by members of the Trades and Services Executive Committee.

One organization reported that it utilizes a policy that the filters are removed from the hoods over the stoves, grills, and so on, every other week. They are then run through the dishwashing machine. The entire system is cleaned by an outside contractor twice a year. It was also noted that a fusible link is installed in the hood, preferably below the fan, to avoid drawing of the flame into the chute in the event of a flare-up. Finally, the unit is protected by a steam extinguishment system.

A representative of another food service group warned that the line on a shut-off device in the chute should not fuse at too low a temperature. They had experience with a link that was set for 168° F. and it was constantly melting and closing off the stack. During one inspection, it was found that the shut-off unit had been wired open. The code permits a maximum of 600° F. on such a fuse and there is some latitude toward a lower temperature since the flash point of grease is 450° F. This organization further requires the cleaning of filters and grill or stove hoods every week, and the entire unit and system is serviced quarterly.

It is important that the complete servicing include not only filters, but the hoods and the complete stack on through to the roof plus roof fans, ventilators, and so on. —*From Safety Newsletter, Trades & Services, Restaurants, Hotels—National Safety Council, January 1961.*



Report of the Nominating Committee, The American Dietetic Association, 1960-61[1]

THE NOMINATING Committee of The American Dietetic Association—Elsie L. Bakken, Margaret Berry, Janette C. Carlsen, Helen G. Ingerson, Margaret W. Mangel, and Katherine Hart, Chairman—presents the following ballot for 1960-61:

PRESIDENT-ELECT

Edith A. Jones: B.S., Univ. of Alabama; M.S., Univ. of Tennessee; dietetic internship, The Johns Hopkins Hospital, Baltimore

POSITIONS HELD:

Administrative Dietitian, Pediatric Dietitian, and Director of Student Curriculum, School of Dietetics, The Johns Hopkins Hospital, Baltimore
Army Dietitian, stateside and European Theater, World War II
Nutritionist, Nutrition Branch, Bureau of State Services, U. S. Public Health Service, Washington, D. C.
Dietitian Consultant, Equipment and Supply Branch, Hospital Facilities Division, Bureau of Medical Services, U. S. Public Health Service
Present position—Chief, Nutrition Department, The Clinical Center, National Institutes of Health, Bethesda, Maryland

PROFESSIONAL ACTIVITIES:

Speaker of the House of Delegates, A.D.A.
Member, Coordinating Cabinet, A.D.A.
Member, Council of the House of Delegates, A.D.A.
Chairman, Nominating, Program Planning, and Program of Work Committees, A.D.A.
Member, Finance Committee, A.D.A.
Project Chairman, Food Administration Section, A.D.A.
Delegate, A.D.A.
President, District of Columbia Dietetic Assn.

PUBLICATIONS:

Papers in this JOURNAL and other professional publications

[1]Other nominations may be made by nomination petitions signed by not less than 400 members of the Association, of whom, not more than 30 shall be from any one state, assented to in writing by the person or persons named thereon as nominees, and filed with the Secretary at the office of the Association on or before April 15, 1961.

SPEAKER-ELECT OF THE HOUSE OF DELEGATES[2,3]

Miriam E. Lowenberg: Ph.B., University of Chicago; M.S., Iowa State University; Ph.D., State University of Iowa; Honorary D.Sc., Hood College

POSITIONS HELD:

Teacher, high schools and small colleges
Assistant Professor, Foods and Nutrition and Child Development, Iowa State Univ.
Chief Nutritionist, Kaiser Child Service Dept., Kaiser Co., Inc., Portland, Ore.
Nutritional Supervisor, Rochester (Minn.) Child Health Institute
Consultant in Pediatrics, Mayo Clinic, Rochester, Minn.
Present position—Head, Dept. of Foods and Nutrition, Pennsylvania State Univ.

PROFESSIONAL ACTIVITIES:

Delegate, A.D.A.
Chairman, Awards, Scholarship, and Loan Fund Board, A.D.A.
Member, Journal Board, A.D.A.
Co-Chairman, Program Planning Committee, A.D.A.
Member, Nominating Committee, A.D.A.
Member, Joint Committee on School Lunch of American Home Economics Assn., American School Food Service Assn., and A.D.A.
President, Pennsylvania Dietetic Assn.
President and Treasurer, Omicron Nu

PUBLICATIONS:

Author or co-author of four books, three bulletins, and six pamphlets
Papers in this JOURNAL and other professional publications, as well as popular periodicals

Marjorie Morrison Donnelly: B.S., Florida State Univ., M.S., Univ. of Tennessee

POSITIONS HELD:

Teacher, Florida public high schools
Nutritionist, Florida State Board of Health, Jacksonville
Field Nutritionist, U. S. Public Health Service, Georgia, Florida, and Michigan
Director, Springfield (Mass.) Nutrition Service Bureau
Director, Nutrition Services, Florida State Board of Health, Jacksonville
Regional Nutrition Consultant, Children's Bureau, U. S. Dept. of Health, Education, and Welfare, Denver
Present position—homemaker, Raleigh, N.C.

TREASURER

Virginia L. Felch: B.S., Iowa State Univ.; dietetic internship, Univ. of California Medical Center, San Francisco

[2]The Nominating Committee of the Association certifies that on November 22, 1960, the Nominating Committee of the House of Delegates—Irene L. Willson, Charlotte M. Young, and Margaret Berry, Chairman—submitted to the Chairman (of the Association Nominating Committee) the names and qualifications of the two members of the Association listed above for the office of Speaker-Elect of the House of Delegates for inclusion on the ballot of the Association for 1960-61.

[3]According to the constitution of The American Dietetic Association, the Chairman of the Nominating Committee of the House of Delegates also serves as a member of the Association Nominating Committee.

POSITIONS HELD:
Food Supervisor, Sky Chefs, Phoenix
Chief Dietitian, Memorial Hospital, Phoenix
Present position—Chief Dietitian, Good Samaritan Hospital, Phoenix
PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
President, Treasurer, Public Relations Chairman, and Section Chairman, Arizona Dietetic Assn.
President, Career Guidance Chairman, Public Relations Chairman, and Section Chairman, Central Arizona Dietetic Assn.
Chairman, Dietetic Section, Assn. of Western Hospitals

Wintress Dalbey Murray: B.S., University of Illinois; dietetic internship, St. Luke's Hospital, Chicago
POSITIONS HELD:
Dietitian, MacNeal Memorial Hospital, Berwyn, Ill.
Therapeutic Dietitian, St. Luke's Hospital, Chicago
Staff and Head Dietitian, VA Hospital, Danville, Ill.
Staff Dietitian, VA Hospital, Hines, Ill.
Present position—Supervisor of Nutrition Services and Director, Administrative Dietetic Internship, Eastman Kodak Co., Rochester, N. Y.
PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
Member, Journal Board, A.D.A.
Member Committee to Study Hospital and Institution Food Service Situations, A.D.A.
Co-Chairman, Section Projects, A.D.A.
President, New York State Dietetic Assn.
Vice-President and Bulletin Editor, Illinois Dietetic Assn.
President, Genesee Dietetic Assn.
Chairman, Rochester and Monroe County Nutrition Committee
PUBLICATIONS:
Papers in this JOURNAL and other professional publications

DELEGATE-AT-LARGE

Geraldine M. Piper: B.A., Eastern Illinois State College, Charleston; M.S., Univ. of Tennessee; dietetic internship, King County Hospital, Seattle
POSITIONS HELD:
Dietitian, Ohio State Univ. Hospital, Columbus
Director, Nutrition Services, Oklahoma Dept. of Health, Oklahoma City
Nutrition Consultant, Diabetes Control Program, U. S. Public Health Service, Washington, D. C.
Associate Professor of Nutrition, Univ. of Tennessee
Regional Nutrition Consultant, U. S. Public Health Service, Charlottesville, Va.
Present position—Chief Nutritionist, Chronic Disease Program, Div. of Special Health Services, U. S. Public Health Service, Washington, D. C.
PROFESSIONAL ACTIVITIES:
Speaker of the House of Delegates, A.D.A.
Member, Coordinating Cabinet, A.D.A.
Member, Council of the House of Delegates, A.D.A.
Chairman, Community Nutrition Section, A.D.A.
Member, Committee on Future Development, A.D.A.
Secretary and Section Chairman, Oklahoma Dietetic Assn.

Lucille M. Refshauge: B.S., Univ. of Nebraska; M.S., Teachers College, Columbia Univ.
POSITIONS HELD:
Dietitian, Gallinger Hospital, Washington, D. C.
Dietitian, Desert Sanatorium, Tucson
Director, Dietary Dept., Mt. Sinai Hospital, Philadelphia
Educational Director, A.D.A., Chicago
Present position—Director of Dietetics, Hartford (Conn.) Hospital
PROFESSIONAL ACTIVITIES:
President, A.D.A.
Speaker of the House of Delegates, A.D.A.
Member, Coordinating Cabinet, A.D.A.
Member, Council of the House of Delegates, A.D.A.
Chairman: Nominating Committee and Committee on the Future Development of the Association, A.D.A.
Member, Membership Committee, A.D.A.
Delegate, A.D.A.
Chairman: Joint American Hospital Assn.–A.D.A. and National League for Nursing–A.D.A. Committees
A.D.A. representative to Joint A.H.A. Commission on Care of the Patient
President, Connecticut Dietetic Assn.
PUBLICATIONS:
Papers in this JOURNAL and other professional publications

NOMINATING COMMITTEE[3]

The following candidates (five of whom are to be elected) for the Nominating Committee for 1961-62 have been selected as representatives of five geographic areas determined on the basis of distribution of the membership. Members are to vote for one person from each geographic area.

Geographic Area I[4]

Frances L. Ware: A.B., University of Illinois; dietetic internship, Barnes Hospital, St. Louis
POSITIONS HELD:
Assistant Dietitian and Acting Chief Dietitian, Barnes Hospital, St. Louis
Administrative Dietitian and Director of Dietetics, St. Luke's Hospital, Chicago
Present position—Director of Dietetics, Rhode Island Hospital, Providence
PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
President, Section Chairman, and Career Guidance Chairman, Rhode Island Dietetic Assn.
Vice-President, Chicago Dietetic Assn.

Ellen B. Guernsey: B.S., Skidmore College; dietetic internship, Rhode Island Hospital, Providence
POSITIONS HELD:
Administrative Dietitian, Park Avenue Hospital, Rochester, N. Y.
Therapeutic Dietitian, Strong Memorial Hospital, Rochester, N. Y.
Present position—Senior Nutritionist, Consultant to Institutions, Bureau of Nutrition, New York State Dept. of Health, Albany
PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
President, New York State Dietetic Assn.
President and Secretary, Rochester (N. Y.) Dietetic Assn.

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[4]Geographic Area I: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, and Pennsylvania.

Section Chairman, Hudson Valley (N. Y.) Dietetic Assn.
Chairman and Secretary, New York State Nutrition Council

Geographic Area II[5]

Bessie L. Davey: B.S., Wayne State Univ.; M.S. and and Ph.D., Oregon State College

POSITIONS HELD:
Research Assistant in Nutrition, Oregon State College
Associate Professor of Home Economics and Research Associate, Research Laboratory of Human Nutrition, Univ. of Alabama
Present position—Professor of Home Economics and Head, Dept. of Foods and Nutrition, Univ. of Alabama

PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
President and Section Chairman, Alabama Dietetic Assn.

PUBLICATIONS:
Papers in this JOURNAL, *Journal of Nutrition*, and *Food Research*

Elizabeth A. Lounds: B.S., Florida State Univ.; M.S., Univ. of Chicago; dietetic internship, Medical College of Virginia, Richmond

POSITIONS HELD:
Assistant Therapeutic Dietitian and Pediatric Dietitian, Medical College of Virginia
Research dietitian, Korea
Present position—Research Dietitian, Medical College of Virginia

PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
President, Vice-President, Section Chairman, and Bulletin Editor, Virginia Dietetic Assn.
President, Richmond Dietetic Assn.

PUBLICATIONS:
Papers in this JOURNAL, *Annals of the New York Academy of Science*, and *Journal of Nutrition*

Geographic Area III[6]

Myrtle B. Van Horne: B.S. and M.S., Michigan State Univ.; dietetic internship, Women's Medical College Hospital, East Falls, Penna.

POSITIONS HELD:
Chief Dietitian, Women's Medical College Hospital
Dietary consultant for private physician
Consultant Dietitian, Michigan Dept. of Health, Lansing
Project Director, Food Service Supervisors' Program, A.D.A.
Present position—Coordinator, Hospital Food Service Supervisors' Course, College of Home Economics, Michigan State Univ.

PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
Member, Joint American Hospital Assn.—A.D.A. Committee
President, Michigan Dietetic Assn.

[5]Geographic Area II: New Jersey, Delaware, Maryland, Washington, D. C., Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, West Virginia, Tennessee, Kentucky, Arkansas, and Louisiana.

[6]Geographic Area III: Michigan, Ohio, Indiana, and Illinois.

Helen E. Volk: B.S., College of St. Teresa, Winona, Minn.; dietetic internship, Ancker Hospital, St. Paul

POSITIONS HELD:
Therapeutic Dietitian, Mercy Hospital, Iowa City
Dietitian-in-Charge, Carle Memorial Hospital, Urbana, Ill.
Assistant Dietitian and Administrative Dietitian, Cincinnati General Hospital
Instructor, College of Nursing and Health, Univ. of Cincinnati
Present position—Director of Dietetics and Dietetic Internship, Cincinnati General Hospital

PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
Member, Finance Committee, A.D.A.
President, Ohio and Cincinnati Dietetic Assns.

Geographic Area IV[7]

Grace E. Olsen: B.S., Iowa State Univ.; M.S., Univ. of Washington; dietetic internship, Massachusetts General Hospital, Boston

POSITIONS HELD:
Dietitian, Memorial Union, Iowa State Univ.
Dietitian, Univ. of Washington Dining Halls
Director of Food Service, The Marston Co., San Diego
Present position—Assistant Professor of Institution Management and Director of Food Service, Memorial Union, Iowa State Univ.

PROFESSIONAL ACTIVITIES:
Member, Dietetic Internship Board, A.D.A.
President, Washington State Dietetic Assn.

Dagmar Tuomin Walch: B.S., Milwaukee-Downer College; dietetic internship Vanderbilt Univ. Hospital, Nashville

POSITIONS HELD:
Dietitian, Vanderbilt Univ. Hospital
Dietitian, Milwaukee County General Hospital
Army dietitian overseas, World War II
Chief Dietitian, Milwaukee County Hospital
Dietetic Supervisor, Milwaukee County Institutions
Present position—homemaker, Wauwatosa, Wis.

PROFESSIONAL ACTIVITIES:
Public Relations Chairman, A.D.A.
Delegate, A.D.A.
President, Section Chairman, and Career Guidance Chairman, Wisconsin Dietetic Assn.
President, Treasurer, and Section Chairman, Milwaukee Dietetic Assn.

Geographic Area V[8]

Maxine Merrick: B.S., Iowa State Univ.; dietetic internship, Latter Day Saints Hospital, Salt Lake City

POSITIONS HELD:
Dietitian, St. Mark's Hospital, Salt Lake City
Army dietitian, World War II
Administrative Dietitian, Sonoma County Hospital, Santa Rosa, Calif.
Staff Dietitian, VA Center, Los Angeles
Chief, Dietetic Service, VA Center, Whipple, Ariz., and VA Hospital, Fresno, Calif.

[7]Geographic Area IV: Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas.

[8]Geographic Area V: Hawaii, Alaska, Washington, Oregon, California, New Mexico, Arizona, Idaho, Utah, Nevada, Montana, Wyoming, and Colorado.

Present position—Chief, Dietetic Service, VA Hospital, San Francisco
PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
Member, Program of Work Committee, A.D.A.
President and Secretary, California Dietetic Assn.
Chairman, Central Valley Region, California Dietetic Assn.

Gladys B. Swenson: B.S., Univ. of Minnesota; dietetic internship, Univ. Hospitals, Minneapolis
POSITIONS HELD:
Dietitian, St. Joseph's Hospital, Phoenix
Army dietitian, World War II
Staff Dietitian, VA Hospitals, Mendota, Wis., and Los Angeles
Chief, Dietetic Service, VA Hospital, Phoenix
Present position—Chief, Dietetic Service, VA Hospital, Portland, Ore.
PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
Member, Membership Committee, A.D.A.
President and Section Chairman, Arizona Dietetic Assn.
Section Chairman, Oregon Dietetic Assn.
President, Portland (Ore.) Dietetic Assn.

Solar Cookers and Ovens

Tests are now under way to harness solar radiation for man's use in obtaining high temperatures for food preparation on simple solar cookers. Cooking by means of the sun's rays is still a process that is extremely limited, and commercial production of the solar oven or cabinet may still be far in the future. Nevertheless, there are many sunny areas in the world where fuel supplies are short, and these cookers could provide a practical solution.

Solar cooking is not accomplished simply by setting out a cake in a solar cabinet and waiting for it to bake. Although it has been calculated that the total radiation received by the earth in two weeks would be equivalent to heating value of all the world's estimated coal resources, the sun's radiation on the earth's surface per square foot is low. Thus, a large reflecting surface is needed to channel the sun's rays into the solar oven.

The Nutrition Division of the Food and Agriculture Organization (FAO) has described two types of solar cookers.

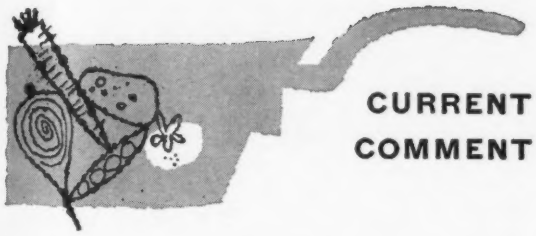
The first is a parabolic type with a fixture at the focus to hold the cooking pot. The second is an insulated oven of about 2 cu. ft. capacity, with a double or treble glass window having four flat reflectors arranged at angles around the window. Both stoves have a reflecting surface area of 12 to 15 sq. ft. Both need to be adjusted towards the sun for maximum radiation at least every half hour.

Tests carried out at FAO headquarters in Rome, and with FAO assistance in Central America, the Near East, and Asia, have confirmed that food *can* be cooked by solar cookers, but only in direct sunlight. Clouds hiding the sun will cause rice to cook considerably more slowly. The cooking time is increased by roughly the amount of time the sun is covered.

Since most types of solar cookers depend on reflected radiation, the material from which the reflector is made is of prime importance. Relatively inexpensive durable aluminum sheet or foil reflectors are used, for mirrors would be too expensive and easily damaged. Since these surfaces only work properly when they are shiny, they must be cleaned before and after cooking. Several laboratories are studying methods to apply a durable transparent finish to the metal reflecting surfaces so they can be easily cleaned and restored to their former brightness.

Practically speaking, several problems appear in the every day use of these solar cookers. Although the stoves may not be too expensive if manufactured on a large scale, they still may be too highly priced for poor homes in underdeveloped countries where cooking is often done on a fire built among a few stones. These large and rather cumbersome stoves also need frequent attention by busy women folk. And, the stoves are also a hazard for children; in the case of the parabolic stove, the cooking pot can be easily upset. Nevertheless, people have overcome similar hazards in learning to use fireplaces and gas or electric stoves for cooking, so this may not be too serious a problem.

The fact remains that food *can* be cooked in solar stoves. In areas where fuel is short or expensive or requires long hours to collect, and the needed sunlight is present, as in many of the economically underdeveloped countries, the solar cooker may become a cheap and practical method of cooking. As with any new experimental appliance, more testing and development of the stoves will be needed, and, home economists will have to train the women in their use.



CURRENT COMMENT

The School Food Director in Emergency Feeding[1]

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IF NON-MILITARY defense is to be a living, vital thing, then the ordinary, working citizen must be the backbone of every group devoted to this pursuit. Since civil defense is composed of organized and coordinated civilian groups whose resources and "know how" function under emergency conditions, the school lunch director with her staff certainly has a role to play.

Whether the emergency be a nuclear attack or a natural disaster, certain fundamentals of living are required—food, shelter, clothing, and moral sustenance. The school as the hub of a community is ready to offer food, shelter, and last, but not least, a lift to the morale. The school lunch staff knows the community, the children, and their parents. At a time when life has been thoroughly disrupted, a familiar face, wise to our small idiosyncrasies, will do much to maintain equilibrium of both individuals and groups.

The school dietitian should and must be a part of any emergency planning committee. Fully cognizant of this, some two years ago, the American Red Cross and the American School Food Service Association arrived at a statement of understanding (1).[2] Each organization has one desire—to cooperate in meeting human needs growing out of natural disasters. The purpose of their agreement is to define the fields of responsibility in which the respective organizations will cooperate for maximum coordination and utilization of resources. This will be a guide for the members of both organizations.

Since the Red Cross must frequently use school buildings for mass feeding and housing in a local community, a trained school food service staff is an asset to both organizations. The Red Cross is, of course, fully aware that local school districts are the proprietors of these buildings and that they must receive permission from local school officials for the use of all school facilities. Specifically, what does the school food service staff have to offer?

(a) Training and experience in quantity food preparation and service. (For those who can remember the leaner years when school kitchens had a four-burner range and a one-basin sink, meal preparation under rugged conditions is not an overwhelming, alarming prospect.)

(b) Teamwork, without which no school lunch program has survived.

(c) Knowledge of their own facilities, local regulations, sources of supplies *and* the ability to prepare a palatable, attractive meal from limited commodities.

The American School Food Service Association, with 20,000 members, is proud of the contribution school food service personnel can and are willing to make to support the civil defense program. Outside the military, more meals are served in schools than in any other food service in this country.

Recognizing the role that we can play, it is jointly recommended by both the American Red Cross and the American School Food Service Association that a member of the latter organization serve as a volunteer member of all local Red Cross chapters' preparedness subcommittees on food. This representative should also act as liaison representative between the two organizations at the local level. Local Red Cross chapters are also anxious to have school food service personnel participate in their emergency mass feeding programs, both as trainees and instructors.

A question you may ask is: How will the Red Cross and school food service organizations actually coordinate their activities in emergency mass feeding? Each local Red Cross chapter has a food subcommittee. The chairman may be the school lunch director for the community or the manager of the largest and best equipped school cafeteria, if there is no over-all director. It is this chairman's responsibility to plan the menus and purchase the food. Under the direction of the canteen chairman, feeding teams may be set up for each school designated as a feeding station. The lunchroom manager for each school will be the supervisor of the feeding team in her respective school. Acting as assistants on each team will be three women from the Red Cross Canteen Service, who have been trained in disaster food service. Consideration should be given to the possibility that 24-hr. service may be necessary, so it is well to plan to stagger teams of workers.

What is the plan of action in the event of an emergency? First, the workers will be notified by the chairman to report to disaster headquarters for

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[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 21, 1960.

[2]A special section of the February 1960 issue of the *School Lunch Journal* was devoted to civil defense and disaster feeding.

assignments. The chairmen of both the Food Committee and Canteen Committee will remain at headquarters. Then, assignments to shelters or feeding stations will be made by the Canteen Committee Chairman.

The American Red Cross assumes financial responsibility for the cost of feeding the needy during a disaster; therefore, they maintain the administrative control of authorized feeding. American School Food Service Association members functioning as volunteers during natural disasters will carry out their assignments as members of the Red Cross disaster relief operation.

In summary, we can expect to coordinate the activities of the two organizations, subject to the approval of local school officials, in three basic areas: (a) the use of school lunchroom facilities as central feeding stations manned and supervised by school lunch personnel with the aid of necessary volunteers from Red Cross; (b) the use of both the lunchroom facilities and personnel for the preparation of food to be delivered to other areas that do not have facilities but require food service. (At the October national meeting of the American School Food Service Association, much discussion was devoted to the development of central kitchens for the preparation of food for several school buildings in a given area. With this type of operation becoming a trend, the school food service people are becoming experts in the transportation of food); (c) the employment of school lunch personnel for preparing and serving food outside of schools when the emergency arises. (Many school food service personnel across the country have participated in outdoor emergency mass feeding exercises and so are trained for this type of activity.)

Reference

(1) The American Red Cross and the American School Food Service Association. School Lunch J. 14: 16 (Feb.), 1960.

Hospital Disaster Feeding Plans[1]

MAJOR ARDETH J. WICK, AMSC

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DURING THE past year, one of the projects of the Disaster Feeding and Civil Defense Planning Committee, Area II of The American Dietetic Association, was the collection of hospital disaster feeding plans.

The need for written plans seems obvious, in order to avoid confusion, to utilize personnel effectively, and to provide food of some sort as quickly as possible. Yet, if the response to inquiries made to a number of hospitals in this area is indicative, many hospitals apparently do not have written plans of this type. Only a small number of plans were received. The information collected from studying these plans, plus comments by dietitians in various hospitals in this area, may be helpful to hospitals which are now preparing written disaster feeding plans.

In the plans reviewed, there seem to be two assumptions about disaster feeding situations: (a) that the physical plant will remain intact in its entirety, or (b) that, while the physical plant is undamaged, possibly water or power may not be available. No plans considered the fact that there might be little or nothing to work with *and* that neither water nor power might be available.

Of course, no predictions can be made about the conditions which a dietitian may face in an emergency. One dietitian humorously remarked, "If I could know in advance just when a disaster would occur, it would be so much easier for me to make plans."

Certain general areas were included in most of the plans, such as:

(a) Designation of authority. Supervision was usually provided for food preparation, food service, dishwashing, and sometimes for waste disposal and sanitation. Detailed instructions were not listed, because it was probably considered that judgment and initiative would be used in meeting unexpected situations. Understudies for supervisors were not always indicated. In large hospitals, it would be important to have more than a few persons familiar with disaster feeding plans; in small hospitals, it would be advisable to inform all dietary personnel about disaster feeding, so that any one of them could take charge, if necessary. Plans did not list means for directing volunteer workers, who undoubtedly would be present and of great assistance; without direction, however, they could not function effectively.

(b) Methods of feeding and serving an increased number of persons. All plans recognized the need to provide, as soon as possible, a hot drink and a hot dish with concentrated food value. Menus were sometimes listed and included such items as cooked cereals, thick vegetable-meat soups, meat, and cereal main dishes. Coffee was always given first consideration. Sometimes plans included lists of food items to be kept on hand at all times for emergencies. There was little mention of immediately using perishable items, should refrigeration fail, in relation to the pre-planned menus.

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 21, 1960.

(c) Equipment required for emergency feeding. Several plans contained lists of equipment, but not every hospital mentioned the problems which would occur if the usual methods of heating food were not available. Some provision for a source of heat other than electricity, gas, or steam would seem essential. It might be necessary to construct heating units, such as pictured in the *Emergency Mass Feeding, Instructor Course*, published in 1954 by the Federal Civil Defense Administration. Fire-making sites in adjacent picnic areas might also be considered.

(d) Possibility of water shortage. This was mentioned in some plans, but mainly as it affected dishwashing and sanitation. Some hospitals included paper goods in their reserve stock lists, others planned to limit the number of eating utensils and dishes issued per person, and some will use compartment trays or plates. Paper cups were often considered a necessity, since most dietary departments planned to distribute coffee at numerous locations, or at least to make it available for distribution.

Other areas mentioned in various plans were the need for special foods for infants and children and provision for fluids when water was restricted. In one instance, a list of foods required for modified diets was included. Diets considered most essential were liquid, soft, and diabetic, although others were included in some plans.

According to dietitians who have worked with disaster feeding plans, certain other activities should receive attention:

(a) Arrangements should be made for the lighting of preparation and service areas, so that, if an emergency occurs at night and there is no electricity, personnel will be able to see to work.

(b) Training programs need to be set up to familiarize dietary personnel with emergency feeding plans. These should be more than one-time training sessions and must be repeated until every person concerned knows what to do.

(c) Stock pile lists should include items needed to maintain sanitation in cleaning, dishwashing, pan washing, and garbage disposal.

(d) Hospital emergency feeding plans should be coordinated as much as possible with community plans to provide food in disaster situations.

One state Civil Defense feeding manual states that good emergency feeding plans are based on simplicity, flexibility, and realism. Dietitians might check the adequacy of their plans by asking the following questions: Are feeding plans based on realistic assumptions? What are these assumptions? Who will do the work and who will be in charge? What foods and supplies will be used, and how will they be obtained? Where and how will meals be prepared and served? Do food service personnel know what they must do in emergency feeding situations?

Copies of emergency feeding plans received from hospitals in this and other areas have been assembled and are available on a loan basis from the Lulu Graves Memorial Library of The American Dietetic Association.

Civil Defense Bibliography Is Revised

COMMITTEE ON DISASTER FEEDING
AND CIVIL DEFENSE PLANNING,
THE AMERICAN DIETETIC ASSOCIATION[1]

IN JANUARY, 1958, the Committee on Disaster Feeding and Civil Defense Planning of The American Dietetic Association published an "Annotated Bibliography on Disaster Feeding" in this JOURNAL (1). Since the entire area of emergency planning for natural or enemy-caused disasters have been greatly expanded during the last three years, the members of the committee for 1959-60, as well as the Association's Consultant on Disaster Feeding and Civil Defense Planning,[2] felt that this bibliography should be up-dated to include information helpful to dietitians, nutritionists, and laymen in widely diversified fields of endeavor. This has been done, and the revised bibliography is now available for a nominal sum[3] from the headquarters office of the Association.

Listings in this revised "Bibliography on Disaster Feeding and Civil Defense Planning," include materials of special interest to public health nutritionists in governmental agencies at all levels. Such workers are being asked to make definite plans for the emergency feeding of many persons. For them, information on the latest thoughts on stock-piling foods for emergency feeding and on the training of persons for emergencies becomes of great importance. For the dietitian engaged in hospital or institutional dietetics, the recent requirement for accreditation by the American Hospital Association that each hospital have a workable disaster plan means that the dietary department must have a practical plan, integrated into the over-all plan. The school lunch dietitian and her staff are playing an ever-expanding role in emergency feeding, subse-

[1]Vera Tharp, Illinois Department of Public Welfare, Springfield, *Chairman.*

[2]Dorothy L. Bovee, American National Red Cross, Washington, D. C.

[3]25 cents.

quent to the "statement of understanding" between the American School Food Service Association and the American National Red Cross, with respect to responsibility for disaster planning and relief (2).

Also, since practically all persons in our profession are now both leaders and homemakers, or are potentially leaders and homemakers, we need to acquire information for use in home preparedness and in assisting others.

The following excerpts from the revised "Bibliography" include some of the more "fundamental" references.

Instruction Materials and Audio-Visual Aids

The following three items have been jointly developed and issued by the American National Red Cross and the Office of Civil and Defense Mobilization as the official instruction media for the basic course in emergency mass feeding. This 16-hr. course is used by both agencies for the uniform training of personnel for mass feeding operations in any type of disaster, whether caused by nature or military actions. All should be ordered from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

BASIC COURSE IN EMERGENCY MASS FEEDING, INSTRUCTORS GUIDE. FCDA IG-12-1 or ARC 488, 1957. Price 40 cents. Six lesson plans.

BASIC COURSE IN EMERGENCY MASS FEEDING, POCKET MANUAL. PM-12-1 or ARC 488-A, 1957. Price 55 cents. Class instruction book. Also designed for use as a reference for all food workers engaged in emergency feeding. Recommended as a source book for all emergency feeding personnel.

EMERGENCY MASS FEEDING. Filmstrip, 33 mm, approximately 60 frames, color; 12-in. record, 33⅓ r.p.m. Designed to serve as a basic training tool; to stimulate group interest; and to recruit for disaster feeding programs. Available free from national, state, or local Civil Defense agencies.

Materials distributed by the Office of Civil and Defense Mobilization, Battle Creek, Michigan

HOME PREPAREDNESS AWARD MATERIALS. This collection includes a kit for group leaders, with the latest information from the Office of Civil and Defense Mobilization. A smaller homemaker's kit is included in the larger leader's kit. Material is designed to help leaders in women's organizations in forming workshops to learn about home and community preparedness.

WHAT YOU SHOULD KNOW ABOUT THE NATIONAL PLAN FOR CIVIL DEFENSE AND DEFENSE MOBILIZATION. MP-7, 1959. Booklet.

ANNEX 18: NATIONAL HEALTH PLAN, 1959

ANNEX 19: EMERGENCY WELFARE PLAN, 1959

ANNEX 31: NATIONAL FOOD PLAN, 1960

ANNEX 32: NATIONAL WATER PLAN, 1960

ANNEX 2, APPENDIX 1: Individual and Family Survival Requirements, 1960

Materials available for loan from the Lulu Graves Memorial Library, The American Dietetic Association

COLLECTION OF DISASTER EXPERIENCES BY INDIVIDUAL MEMBERS OF THE ASSOCIATION AND OF DISASTER PLANS OF INDIVIDUAL HOSPITALS.

These collections are the result of the committees' endeavors for the past several years. They include individuals' experiences in tornadoes, floods, hurricanes, fires, and so on. The hospital disaster plans include those of mental and Army hospitals, as well as large and small hospitals. Since this is a continuing project and assistance is constantly being requested of the Committee, persons having experiences or plans are urged to forward them to their regional Civil Defense representative, the chairman of the national committee, or the headquarters office of the Association.

The Committee feels that the "Bibliography" should have a place in each member's personal library, that it should be added to the libraries of state and local dietetic associations and to those of allied professions. In addition to the items listed above, specific information regarding all phases of emergency feeding, civil defense planning, and disaster research, has been included in articles in this JOURNAL and publications of allied professions.

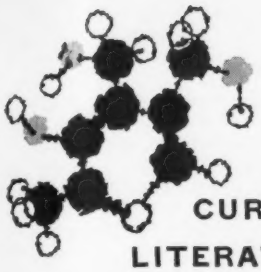
References

(1) COMM. ON DISASTER FEEDING AND CIVIL DEFENSE PLANNING, A.D.A.: Annotated bibliography on disaster feeding. J. Am. Dietet. A. 34: 58, 1958.

(2) The American Red Cross and the American School Food Service Association. School Lunch J. 14: 16 (Feb.), 1960.

Hazard of Gas Refrigerators

New York City has recently banned three classes of household gas refrigerators because of the danger of carbon monoxide. Since 1955, defective units have been the cause of nine deaths and a hundred serious illnesses. One type that was banned (water-cooled) has not been made for twenty-five years. Health officials indicated that all gas refrigerators may be outlawed unless the industry and other interested groups provide a satisfactory inspection and servicing program to eliminate potential dangers.—*From the Wall Street Journal, January 19, 1961. Contributed by Mary P. Huddleson, New Canaan, Connecticut.*



CURRENT LITERATURE

Contributed by Janette C Carlsen, The Johns Hopkins Hospital, Baltimore; Margene A. Wagstaff, Elmhurst, Illinois: the following dietetic interns: Charity Hospital, New Orleans—Sandra Kennard and Joan O'Malley; VA Hospital, Houston—Earlene Anderson and Janice Worley; VA Center, Los Angeles—Nancy L. Alcorn, Georgina O. Chang, Cynthia G. Danielson, Margaret E. Dorsey, Mary Flick, Viola Hardin, Carolyn Henricks, Kristin Holmberg, Karen A. Mund, Nadyne Rhinelander, Mary Lee Verderaime, and Patricia Wallace; Frank E. Rice, Ph.D., Consultant in Nutrition, Chicago; and the Journal staff.

THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 8, November-December, 1960

*Food, nutrition and the space traveler. B. Finkelstein and A. A. Taylor.—p. 793.

*The significance of the history of goiter for the etiology of the disease. I. Greenwald.—p. 801.

*Effect of mixed fat formula feeding on serum cholesterol level in man. II. Further study utilizing a twenty per cent fat formula. C. B. Davis, Jr., R. E. Clancy, B. E. Cooney, D. M. Hegsted, and J. H. Hall. —p. 808.

*Effective long term weight reduction. Experiences with Metrecal. H. J. Roberts.—p. 817.

Studies of vitamin A deficiency in children. C. Gopalan, P. S. Venkatachalam, and B. Bhavani.—p. 833.

*Riboflavin in red blood cells in relation to dietary intake of children. V. A. Beal and J. J. Van Buskirk.—p. 841.

*Trace metals in human plasma and red blood cells. A study of magnesium, chromium, nickel, copper and zinc. W. B. Herring, B. S. Leavell, L. M. Paixao, and J. H. Yoe. I. Observations on normal subjects.—p. 846. II. Observations of patients with some hematologic diseases.—p. 855.

Some observations of the nutritional status of medical students in the Brazilian Amazon. F. W. Lowenstein.—p. 870.

Diet and health of a group of African agricultural workers in South Africa. J. H. Abramson, C. Slome, and N. T. Ward.—p. 875.

Balance studies on peanut biscuit in the treatment of kwashbiorkor. K. M. Clegg and F. R. A. Dean.—p. 885.

*Planning the low calorie diet. C. M. Young. —p. 896.

Food for the Space Traveler. Short trips of two to three days will allow for ready-to-eat foods and stored water. Weight becomes a problem in longer trips lasting up to several months. Water can be recovered from the atmosphere and reclaimed from body wastes, then purified and made safe for use. Foods must be concentrated and dehydrated, in quick-serve, lightweight containers, and will average 3½ lb. per day. Food at this weight would exact too great a penalty on a voyage of over six months. Beyond this point, regeneration of carbon and nitrogen compounds will be required; algae may provide a practical means of accomplishing this regeneration. Application of data from manned high altitude balloon flights and isolation studies indicate that palatability, acceptability, and ease of manipulation of food will be important; likes and dislikes of each person engaged in space travel must be considered. The environment of the cabin and the factor of weightlessness will mean that, in lieu of the usual utensils, liquids and semi-solids in collapsible "squeeze" tubes will be used. Sample menus for initial flights are included, as are recommendations for preflight feeding. Final determinations of nutritional requirements will come only when man goes into space and returns safely to earth.

History of Goiter. Is it possible that endemic goiter is an infectious disease? History points to a non-nutritional cause. Reference to goiter are cited in the history of Canada, the U. S., Central and South America, Africa, Europe, and among the Jews. Variations in the rate of onset, in the proportion of accompanying cretinism, deaf-mutism, and hyperthyroidism, and in its occurrence in infants and animals could be due to differences in the strains of the infectious agent.

Cholesterol Level in Man. There is concern over the effect of dietary fat, both quantity and quality, on human metabolism as applied to the etiology of atherosclerotic processes. This, and a previously reported study, demonstrate that the effect of lowering the levels of serum cholesterol can be accomplished just as well with a formula containing only 20 per cent fat as with one containing 40 per cent fat. The feedings, utilizing safflower oil and safflower-coconut oil mixture, were administered to ten patients with hypercholesteremia. It is concluded that no one level of total fat can be chosen as optimal. The number of patients and the duration of the study were not sufficient to evaluate any effect on atherosclerotic processes.

Metrecal in Weight Reduction. A weight reducing program is outlined for well motivated patients, involving explanation of the diet itself, physical activity, creative activity, and psychologic aspects. This program may not be sufficient with some patients, such as those with serious medical disorders making prompt weight reduction mandatory; those requiring surgery, whose massive panniculus poses an increased hazard; those who have become discouraged. Metrecal has been utilized in the comprehensive, long-term management of these latter groups. The techniques of administration, side effects encountered, an analysis of results, and a comparison with previous regimens are reported. The author lists sixteen advantages to this type of program. He has employed Metrecal in a three-stage program: Metrecal alone, Metrecal alternating with diet, and diet alone. Fifty-seven patients took part in the study. Average weight reduction during a month of therapy, using either of the first two stages of the regimen, was 12.8 lb. At six weeks (using data from patients following all three stages), total average weight loss was 16 lb. It is interesting that hypercholesteremic patients showed lower serum cholesterol following the regimen. No changes in prothrombin time was seen in those with coronary heart or thromboembolic disorders. Side effects, including a tendency to constipation in a third of the subjects, diarrhea in five, and other gastrointestinal symptoms in ten, are chronicled. The author advises that special precautions should be taken with patients with peptic ulcers, gout, diabetes, and cirrhosis. Nevertheless, he feels that this formula diet is of considerable value in both the initiation and maintenance of weight loss "without insulting the body's metabolic economy."

Riboflavin in Red Blood Cells. The level of riboflavin in red blood cells has been suggested as a sensitive and practical index for evaluating riboflavin nutrition. Determinations were made on the blood and in the diet of thirty-two boys and thirty-six girls ranging in age from one month to eighteen years. Although both dietary intake of riboflavin per kilogram body weight and the riboflavin level in red blood cells decrease with age, the level of dietary intake seems to bear no significant relationship to the level of riboflavin in red blood cells in healthy children.

Trace Metals in Blood of Normal Persons. This study was conducted in an attempt to define any correlations which may exist between disease states and alterations in the levels of certain metallic micro-elements in the blood. This paper concerns itself only with observations made on normal blood. Data are given for magnesium, chromium, nickel, copper, and zinc. There were no significant differences attributable to sex and race. Sixty-one subjects participated.

Trace Metals in Blood of Patients with Hematologic Diseases. In none of the diseases studied were abnormal levels of plasma magnesium found, except for a patient with untreated Hodgkin's diseases; levels of magnesium in red blood cells did show variation. For chromium, values were consistently normal in both plasma and red cells. Nickel values were highly variable in the diseases studied, and no valid conclusions could be drawn. In the case of copper, no consistent abnormalities could be found (this is contrary to reports of elevation of levels of copper in red blood cells of patients with iron deficiency

anemia). No consistent abnormalities could be found in either cells or plasma for zinc.

Planning the Low-Calorie Diet. Taken into account must be the condition and outlook of the patient and the adequacy of the diet at these points: (a) satisfying the nutritional needs, (b) adapting to the habits and tastes of the patient, (c) protecting from hunger, (d) making the regimen easy to follow. The reducing diet must also induce a retraining in eating habits over a period of time. Tables give a sample high-protein, low-calorie diet based on a normal dietary pattern and a suggested meal pattern. Modifications and requirements, to meet individual needs, are discussed.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 240, November, 1960

*Normal protein bound iodine values in hyperthyroidism and cretinism. N. G. Schneeberg.—p. 552.

Vol. 240, December, 1960

*Leucine-induced hypoglycemia—A review and speculations. A. M. DiGeorge and V. H. Auerbach.—p. 792.

Normal PBI Values. Serum protein-bound iodine (PBI) has come to be accepted as an accurate reflection of thyroid function. Clinical judgment and other tests are also needed, however. The author cites several cases in which the PBI was normal but the patient had either hyperthyroidism, hypothyroidism, or cretinism. He points out that in the case of juvenile hypothyroidism, failure to arrive at an accurate diagnosis would be tragic, and that reliance on the PBI test alone could prove harmful. He gives three explanations for the normal values in these diseases: (a) physiologic variation, (b) diminished transport of protein for thyroid hormone, and (c) unusually rapid degradation rate of thyroxine in Graves' disease.

Leucine-Induced Hypoglycemia. It has been demonstrated that feeding L-leucine is followed by a short interval of hypoglycemia, especially in infants and children with idiopathic hypoglycemia. The precise mechanism by which leucine produces hypoglycemia is not known; however, there is a clear relationship between the administration of leucine, circulating insulin levels, and the resulting hypoglycemia. It is presumed that increased production or release of insulin, or both, is the determining factor. There is also some evidence that leucine may be involved in glucose homeostasis in normal individuals. There are many discrepancies in reports on which of the other amino acids will produce hypoglycemia and whether there is familial incidence in the leucine-sensitive sub-group.

THE AMERICAN JOURNAL OF NURSING

Vol. 60, December, 1960

*A look at job descriptions. M. Frey.—p. 1782.

Job Descriptions. Preparing job descriptions involves certain preliminary procedures. Among these is communication to employees of the purpose of the undertaking, thus removing any apprehension on their part. It is also necessary to recognize the basic "wants" of all staff members. Next, it is important to consider the responsibilities and activities that should be delegated. Action follows, with the supervisory personnel discussing and outlining their jobs. Consideration of terminology is required, mutual understanding of words and duties being clear. The value and uses of the finished job description are enumerated.

AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY

Vol. 80, December, 1960

*Periplacental hemorrhage and renal necrosis in protein and choline deficient pregnant rats following progesterone administration. H. C. Moore.—p. 1203.

Protein and Choline Deficiencies in Pregnant Rats. Three diets were fed to pregnant rats: (a) choline-deficient; (b) a choline-deficient diet with 0.5 gm. per 100 gm. choline chloride added; and (c) normal ration. Nineteen days after the first day of mating, seven pregnant females received intramuscular progesterone in four daily doses of 5 mg. each. Fourteen non-pregnant rats were also injected after equivalent periods on the test diets. At autopsy within 24 hr. of delivery, about a fourth suffered from intra-uterine death of their fetuses and/or periplacental hemorrhage, and about a sixth had renal or liver necrosis. All animals with uterine lesions had received deficient diets. Until the effect of progesterone at different and precise times of gestation is known, the effect of deficient diets must remain problematical. The similarity of these findings with the condition of human abruptio placentae is pointed out.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 50, November, 1960

*Recent developments in inborn errors of metabolism. D. Y.-Y Hsia.—p. 1653.

The detection and diagnosis of phenylketonuria. R. J. Allen.—p. 1662.

Phenylketonuria: screening programs and testing methods. W. R. Centerwall, R. F. Chinnock, and A. Pusavat.—p. 1667.

Vol. 50, December 1960

*Seasonal coliform variations in well waters. R. A. Voelker, H. Heukelekian, and H. E. Orford.—p. 1873.

*Protein and amino acid additions to foods. O. L. Kline.—p. 1890.

Inborn Errors of Metabolism. Today, there are known to be over fifty inborn errors of metabolism. They are presented here as public health problems and are illustrated by discussions of phenylketonuria and galactosemia. Phenylketonuria is a hereditary condition characterized by mental retardation and the presence of phenylpyruvic acid in the urine, and is transmitted by a rare recessive gene. It is important because it is the first type of mental deficiency which may be prevented by means of early (under six years of age) treatment with a special low-phenylalanine diet. The diet comprises a low-phenylalanine protein hydrolysate, 1 per cent protein fruits and vegetables, gluten-free bread, sugar and butter or Lipomul, and vitamins and minerals. Galactosemia is a hereditary condition characterized by inability to convert galactose to glucose and is transmitted as an autosomal recessive. It may be treated by withholding all milk and milk products. No additional long-term defects will result if lactose or galactose is withheld in the first few weeks of life. Mention is made also of other inborn errors of metabolism: cystic fibrosis of the pancreas (early diagnosis prevents chronic pulmonary complications); deficiency of glucose-6-phosphate dehydrogenase, an enzyme needed for glutathione metabolism in red cells (15 per cent of Negro males and 8 per cent of Negro females have this defect, shown only when exposed to such hemolytic agents as the fava bean, primaquine, aspirin, or sulfa drugs); hereditary conditions of morphologic nature, of functional nature, and of etiologic nature.

Bacterial Content of Well Waters. Season of the year is a major factor controlling coliform content of well water. This was shown in a year's study of two private home wells and borne out by routine bacteriologic analyses of waters from 2417 private wells. High counts were typical of the warmer months, with counts decreasing in the fall to minimum values about January and increasing through the spring.

Addition of Protein and Amino Acids to Foods. Protein nutrition is reviewed. The fact that in the U.S., protein intake is for the most part adequate, is emphasized. In the light of the facts available, the Food and Drug Administration has been concerned with the marked commercial trend emphasizing protein content and quality of food products (cereal foods and breads in particular). Labeling and advertising contain implications that are misleading. Informative labeling is discussed.

AMERICAN JOURNAL OF SURGERY

Vol. 100, December, 1960

*Early closure of cleft lip and palate. L. W. Schultz.—p. 869

Cleft Lip and Palate. A cleft palate of any kind should be closed as early as possible. "Early" means within a period of three months after birth. Time of closure depends on the width of cleft, weight of baby, and power of baby to assimilate food. Because an infant of six months will want milk principally and will sleep a good deal, there is time for the surgical incision to heal. On the other hand, a child two years old is eating solid foods

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IN ADDITION, NEW CARNATION INSTANT...

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and is not satisfied with milk alone. This child will not be quiet postoperatively and healing may therefore be retarded. This is only one among many advantages for early cleft operations.

ANNALS OF BIOCHEMISTRY AND EXPERIMENTAL MEDICINE

Vol. 20, June, 1960

*Studies on milk substitutes of vegetable origin. Part II. The effect of fortification with DL-methionine on the nutritive value of spray dried powder obtained from a blend of soya-bean and groundnut milks. S. R. Shurpalekar, M. R. Chandrasekhara, N. L. Lahiry, M. Swaminathan, K. Indiramma, and V. Subrahmanyan.—p. 145.

Milk Substitutes. It is known that milk substitutes prepared from soybean and groundnut have considerably less nutritive value than cow's milk. Reported here are the nutritive values of soybean milk powder, groundnut (peanut) milk powder, and modified cow's milk powder and their blends with and without methionine supplement. Milk reconstituted from a blend of the vegetable powders promoted fairly good growth in albino rats as compared with reconstituted modified cow's milk having the same protein content (17.1 gm.). Milk reconstituted from a mixture of four parts vegetable milk powder and one part modified cow's milk powder promoted significantly higher growth than vegetable milk alone. Fortification of vegetable milk powder with DL-methionine caused a marked improvement in its growth-promoting value. Information is included on composition of blood and liver and carcass, and on the protein efficiency ratio.

BRITISH MEDICAL JOURNAL

No. 5211, November 19, 1960

*Vitamin B_{12} neuropathy after gastrectomy.—p. 1507.

No. 5213, December 3, 1960

*Bread and flour.—p. 1659.

Vitamin-B_{12} Neuropathy after Gastrectomy. Total gastrectomy may be followed by a megaloblastic anemia due to deficiency of vitamin B_{12}, since the area of stomach is removed which secretes the "intrinsic factor" essential for vitamin B_{12} absorption from the small intestine. Patients who have had partial gastrectomies or one of the other operations that involves an anastomosis between stomach and jejunun develop megaloblastic anemia much less frequently. Most of these cases seem to occur five years or even longer after surgery, when the patient may have ceased follow-up visits. Consequently, the onus of watching gastrectomy patients for the onset of complications falls on the general practitioner. It has also been shown that reduced absorption of vitamin B_{12} is more common when the initial lesion is a gastric ulcer than when it is a duodenal ulcer, and this may well be due to a co-existent atrophic gastritis.

Bread and Flour. A report by the British Food Standards Committee recomends legal control over the composition, description, labeling, and advertising of bread and flour. The consumer must be protected from being "fobbed off" with products which are incorrectly described or to which some imaginary health-giving property is attributed. His brown loaf must be made from brown flour and not from flour colored artificially. A suggestion that a loaf provides more than the usual amount of energy, for example, will not be allowed. Though there is no clear-cut evidence of deficiencies of thiamine, niacin, or iron in the population, it is desirable to assure the protection of those groups, such as large families in the lower social classes, who may be unduly vulnerable. Fortification supplies 10 per cent total iron, 21 per cent thiamine, and 15 per cent niacin in Great Britain. Protein-enriched bread must have a minimum of 21 to 22 per cent protein. Starch-reduced bread must have carbohydrates reduced to less than 50 per cent normal value. Pending further studies, flour used for bread making should be treated only with benzoyl peroxide (bleaching agent), ascorbic acid (maturing agent), potassium bromate (maturing agent), ammonium or potassium persulphate (maturing agent), or commercial chlorine dioxide (maturing agent). For cake flour only, heavy treatment with chlorine is to be allowed, and sulphur dioxide may be used for preparing flour suitable for making biscuits.

CANADIAN PUBLIC HEALTH JOURNAL

Vol. 51, November, 1960

*Emotional and metabolic factors in obesity. D. L. Hirsch and W. I. Morse.—p. 450.

Factors in Obesity. The lifetime prevalence of psychiatric disturbance of a degree sufficient to need treatment appeared to be no greater in a group of obese patients than in a random population sample. No specific personality type associated with obesity could be delineated, but dependence was a prominent characteristic in 50 per cent of the patients. While the patients' moods affected their eating behavior, there was marked variability in responses to different moods in any one patient, depending on his personality, and overeating was by no means the uniform response to stress. Only a small fraction of the patients denied overeating, but among all patients, inconsistencies in reporting food intake to different observers made actual asssessment of intake impossible. The rate of weight loss bore no relation to the diet prescribed. The basal metabolic rate was significantly lower in individuals classified as dependent. There was some evidence that dependency was also related to serum cholesterol concentration, and preliminary observations suggested that these changes might be mediated by small differences in thyroid function. No other statistically significant correlations were found between the psychiatric observations and the metabolic parameters. This failure to obtain correlations might be attributable to the relative superficiality of the interview technique and failure to relate the metabolic studies to the emotional state of the patient at the time.

CEREAL CHEMISTRY

Vol. 37, November, 1960

*The distribution of the amino acids of wheat in commercial mill products. F. N. Hepburn, W. K. Calhoun, and W. B. Bradley.—p. 749.

*The distribution of the vitamins of wheat in commercial mill products. W. K. Calhoun, F. N. Hepburn, and W. B. Bradley.—p. 755.

Amino Acids of Mill Products. The eighteen commonly occurring amino acids were determined by microbiologic analysis in two blends of hard red spring and hard red winter wheats and in the flours produced from them. The uniformity of amino acid concentrations within the flour fractions explains the previous observation that the amino acid distribution of flour proteins was independent of the degree of separation of the flour. It is suggested that the consistency of amino acid distribution in bread from protein may be related to the selection and blending of wheats.

Vitamins in Wheat Products. Nine vitamins were determined in a chemical wheat blend and in the products resulting from its milling. Choline was not concentrated in any one product. The other vitamins (thiamine, riboflavin, niacin, pantothenic acid, folic acid, biotin, para-aminobenzoic acid, and inositol) followed, in general, the well known distribution pattern of the enrichment vitamins (thiamine, riboflavin, and niacin) with the greatest proportion (50 to 90 per cent) contained in bran and shorts. Also noted was a pronounced and progressive increase in all vitamins except choline with decreasing grades of flour.

CIRCULATION

Vol. 22, December, 1960

*Serum cholesterol and relative body weight of coronary patients in different populations. A. Keys and F. Fidanza.—p. 1091.

Serum Cholesterol and Weight of Coronary Patients. Considerable data have been collected on characteristics of men with coronary heart diseases, compared with suitable controls, in this country. There is little information on coronary patients in countries where the disease is less common. This paper reports findings in Naples, Italy, and St. Paul and Minneapolis, Minnesota. The Twin City patients did not differ in relative body weight from their controls. Both Italian groups showed higher relative body weights. The serum total cholesterol concentration was significantly higher in the groups of coronary patients than in the controls. Differences in

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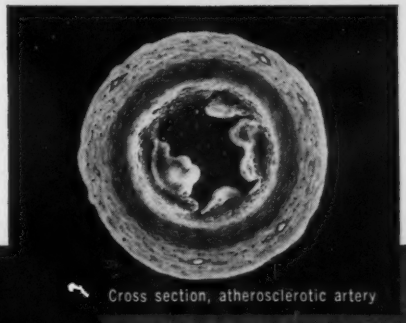
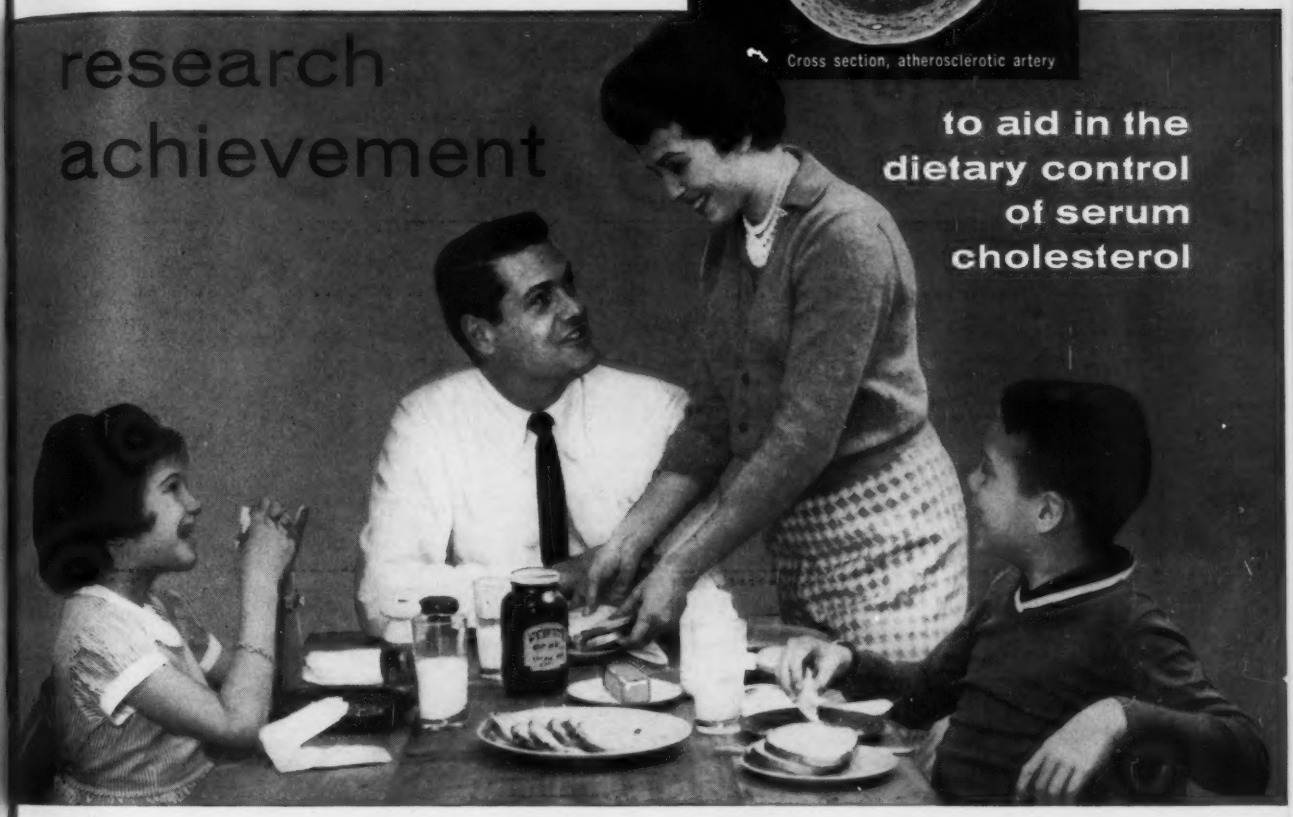


Cross section, atherosclerotic artery



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serum cholesterol are discussed and eight tables give the details of the study.

ENDOCRINOLOGY

Vol. 67, November, 1960

*Extra-adrenal sources and regulation of plasma ascorbic acid during hemorrhage and visceral ischemia. M. A. Slusher and S. Roberts.—p. 688.

Vol. 67, December, 1960

*Gluconeogenesis and pyruvate metabolism in rat kidney, in vitro. B. R. Landau.—p. 744.

*Carbohydrate metabolism in pregnancy; the turnover of I^{131}-insulin in the pregnant rat. C. J. Goodner and N. Freinkel.—p. 862.

Sources and Regulation of Ascorbic Acid. Elevated plasma ascorbic acid levels were observed in adrenalectomized rats after acute hemorrhage and after hepatic ischemia induced by clamping afferent vessels to the liver. The ascorbic acid level was proportional to the severity of the circulatory stress. Results were similar in rats adrenalectomized at the time of the experiment or 24 hr. before. However, hypophysectomy 24 hr. prior to acute adrenalectomy resulted in elevated resting levels of plasma ascorbic acid and a greater response to circulatory stress. In all animals, severe hemorrhage produced higher ascorbic acid levels in the liver afferent than in other vessels, suggesting that the liver was the source of elevated plasma ascorbic acid. However, the spleen also contributed to elevated plasma ascorbic acid levels after severe hepatic ischemia, since the exclusion of the spleen from the circulation eliminated the inordinate rise in ascorbic acid in the hepatic portal vein, while ascorbic acid in the liver's afferent vessels was maintained at a higher level than in the systemic circulation. It is concluded that the liver and spleen are major sources of plasma ascorbic acid during hemorrhage and hepatic ischemia, and that ascorbic acid release from these organs can occur in the absence of pituitary-adrenocortical function.

Gluconeogenesis and Pyruvate Metabolism. Slices from kidney of normal, alloxan diabetic, and cortisone-treated rats were incubated with pyruvate-2-C^{14} and the incorporation of C^{14} studied. Pyruvate uptake and the addition of labeled carbon into glucose and lactate were greater than normal in the diabetic and cortisone-treated animals. The amount of labeled carbon in glycogen was larger in the cortisone-treated slices. There was a large increase in glucose content above normal in the incubations with diabetic and cortisone-treated specimens. It is concluded that in diabetes mellitus and as a result of cortisone therapy, there is an elevation of gluconeogenesis and alteration of the metabolism of pyruvate.

Insulin Metabolism in Pregnancy. In examining the effects of pregnancy on insulin metabolism, fractional turnover was measured in normal and one-day pregnant rats, and in animals 1 to 8 hr. after parturition. Half-time for the disappearance of I^{131}-insulin from the circulation averaged 15.4 min. in the pregnant rats and 20.8 min. in non-pregnant litter mates. On delivery, the high insulin turnover dropped to normal almost immediately.

FOOD AND NUTRITION NOTES AND REVIEWS (Australia)

Vol. 17, September and October, 1960

*Gluten-free bread for coeliacs. F. Townsend and A. Rowe.—p. 67.

*Australian breads—review of their nutritional significance.—p. 69.

*Uncertainties in assessing nutritional status. L. B. Pett.—p. 72.

Gluten-Free Bread for Celiacs. A recipe is given for a gluten-free bread using pre-gelatinized starch. It is suitable for commercial or institutional preparation (it requires careful control). Another recipe is included which can be made successfully in the home. It requires a chemical leavening. Preparation would be even simpler if a packaged premix could be developed from the second recipe.

Australian Breads. It was found that all Australian breads analyzed contained more than enough thiamine to complete the metabolism of the carbohydrates, protein, and fat of the bread itself. The thiamine:calorie ratio of some Australian diets would be improved if more bread were consumed. Excluding alcoholics, the majority of individuals receive in their diet more than the "minimal" amount of thiamine required to complete the metabolic steps. Enrichment of bread with additional thiamine is not considered necessary.

Assessing Nutritional Status. Five procedures are commonly used to assess nutritional status: (a) food records, (b) measurements of growth in children and overweight adults, (c) biochemical tests in blood or urine for certain constituents, (d) disturbed structure or function where a particular dietary substance has a specific measurable job in the body, and (e) clinical judgment. Uncertainties of interpretation of all these methods are pointed out. Steps are being taken to overcome them in Canada.

FOOD RESEARCH

Vol. 25, November-December, 1960

*The effects of pre-irradiation heat inactivation of enzymes on palatability of beef and pork. A. M. Pearson, L. J. Bratzler, and R. N. Costilow.—p. 681.

*The effect of pre- and post-enzyme inactivation storage on irradiated beef and pork roasts. A. M. Pearson, L. J. Bratzler, and G. D. Gernon, Jr.—p. 687.

*The role of fat in the flavor of lamb and mutton as tested with broths and with depot fats. J. Hofstrand and M. Jacobson.—p. 706.

*Separation and identification of cooked beef flavor components. W. E. Kramlich and A. M. Pearson.—p. 712.

*The nonspecificity of differences in taste testing for preference. G. A. Baker, M. A. Amerine, E. B. Roessler, and F. Filipello.—p. 810.

Palatability of Pre-Irradiation Enzyme-Inactivated Meat. Enzymes in irradiated meats must be inactivated to prevent objectionable flavor changes during storage. Results of panel evaluation, texture observations, and percentage of amino nitrogen indicated that the higher external temperatures (212°F.) more effectively destroyed the enzymes in beef. For pork, the lowest temperature (160°F.) appeared to prevent proteolysis and loss of acceptability.

Enzyme-Inactivation Storage in Irradiated Meat. Earlier work on inactivation has generally been carried out in an open container, sealing the cans after cooling (to avoid the typical canned meat flavor). In this study, there were no adverse effects from inactivating the enzymes in sealed cans. Panel tasting, amino nitrogen percentage, and texture of beef and pork roasts indicate that enzyme inactivation can be satisfactorily delayed for eight days with beef and up to sixteen days with pork. It was hoped that improvement of texture would result from inactivation of enzymes after storage (a problem in samples inactivated prior to irradiation). This was not the case, however; tissue breakdown still occurred and after ninety days total storage, practically all samples were mushy.

Flavor of Lamb and Mutton. The influence of fat on the flavor of lamb and mutton is not known. Consequently, mutton broths of varying fat content and treated samples of lamb depot fat were submitted to a taste panel. The amount or absence of fat did not significantly affect the taste of the broths. However, fat may contribute to the aroma. Depot fats were found to have flavor components.

Cooked Beef Flavor Components. This study was made to separate and identify the volatile components from cooked beef, which may possibly contribute to its flavor. Procedures are described. Carbon dioxide, methyl mercaptan, acetone, and acetaldehyde were present in the volatile fraction; methyl sulphide and water were tentatively identified as being present. A beef-like flavor was produced on bubbling the mixed volatiles through distilled water, but the relative importance of the different components is yet to be resolved.

Taste Preference. Mass consumer preference testing, based on one test per consumer and on multiple tests per consumer, is discussed. Raisins were used in an experiment which emphasized the distinction between difference testing and preference ratings on organoleptic examinations of foods, beverages, perfumes, and so on. This method, described and analyzed, is presented as a reliable, versatile, meaningful interpretation of consumer preference.

GASTROENTEROLOGY

Vol. 39, November, 1960

*Results of vagotomy and antral resection in

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surgical treatment of duodenal ulcer. H. W. Scott, Jr., J. L. Herrington, Jr., L. W. Edwards, H. J. Shull, S. E. Stephenson, Jr., J. L. Sawyers, and K. L. Classen. —p. 590.

Vol. 39, December, 1960

*Demonstration of the effect of oral fat without choline within one hour on centrolobular hepatic cells of the rat. E. A. Porta and W. S. Hartroft.—p. 758.

Vagotomy and Antral Resection. Follow-ups were done from less than one year to more than thirteen years after 765 patients underwent vagotomy and antral resection for duodenal ulcer. Over 90 per cent have had successful results. Anemias, nutritional difficulties, and weight loss were not major problems. Patients were advised to follow a high-protein, high-fat, low-carbohydrate diet. They were also instructed to omit liquids at meals and for an hour after eating. After they could tolerate carbohydrates, the majority could follow a normal diet with few restrictions.

Effect of Oral Fat on Liver Cells. Half of sixty-five rats force fed with corn oil were supplemented at the same time with choline and killed, 1, 2, and 4 hr. later. One group killed at 4 hr. had received a second dose of choline 1 hr. before death. Animals of the control group were killed after a fasting period of 3 hr. Only in the first hour after administration was there detected any statistical difference in the action of choline given with fat in suppressing centrolobular lipids. The choline must reach the liver at the same time the absorbed fat reaches it.

JOURNAL OF THE AMERICAN GERIATICS SOCIETY

Vol. 8, December, 1960

*A seven-year study of vitamin B_{12} deficiency exclusive of macrocytic anemia: Preliminary report. H. Bakke.—p. 903.

Vol. 9, January, 1961

*Nutritional problems and operability in the aged. W. H. Cole and W. H. Harridge.—p. 16.

Vitamin B_{12} Deficiency. Vitamin B_{12} deficiency, exclusive of macrocytic anemia, affects older persons. Many are prone to accept the vitamin deficiency as a part of aging. A triad of symptoms was established after observation of approximately one hundred patients over seventy years: (a) chronic vertigo, (b) sudden or temporary loss of control of a limb with muscle weakness, and (c) some form of paresthesia. It should aid in making the diagnosis of vitamin B_{12} deficiency in a late stage and in elderly people. A weekly dosage of 500 mcg. vitamin B_{12} by injection prevented relapse and should be continued throughout life.

Nutrition and Operability in the Aged. Aged patients (over sixty) will tolerate the average major operation as well as younger patients if there are no complications; they will not tolerate the extremely serious operation as well, even though no deficiencies are present. Malnutrition is perhaps the most important deficiency observed in the aged group and must be corrected before surgery if an optimum mortality rate is to be expected. Causes of malnutrition are discussed, physiologic differences between the young and aged are pointed up, and methods of correcting malnutrition are given. During two periods, 1948-1952 and 1955-1959, a total of 10,844 operations were studied. The percentage of patients over sixty undergoing major operations increased by 0.56 per cent per year during the intervening seven years.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 174, December 10, 1960

*Copper poisoning. Foreign Letters–United Kingdom.—p. 1988.

*Shortage of dietitians. Foreign Letters–United Kingdom.—p. 1990.

Vol. 174, December 17, 1960

*Obesity. Foreign Letters–Brazil.—p. 2083.

*Pumpkin and sunflower seeds. Questions and Answers.—p. 2093.

Vol. 174, December 24, 1960

*Postsurgical problems of the gastrointestinal tract. T. E. Machella.—p. 2111.

Vol. 174, December 31, 1960

*Federal government does not inspect meat for trichinosis. J. H. Walters and G. C. Shelton. Correspondence.—p. 2236.

Copper Poisoning. Eighteen workers in a Liverpool factory developed acute copper poisoning due to contaminated water from a corroded hot water heater used in making tea. Symptoms were abdominal pain, vomiting, diarrhea, headache, and dizziness. Corrosion of the interior copper parts released copper salts in the water.

Shortage of Dietitians. In all the hospitals in England and Wales, there are only ninety-five therapeutic dietitians. The shortage is due to length of training and unsatisfactory salary scales. It is suggested that the four-year course in dietetics be shortened to three.

Obesity. Urinary steroid levels and the glycemic curves were determined in fifty-one obese patients. Results indicated that in simple obesity, no clear alterations of the adrenal activity occur. Nevertheless, in hypertensive obese patients, the levels of the hydroxycorticoids and the ketosteroids were markedly higher than normal.

Pumpkin and Sunflower Seeds. No references can be found which suggest that pumpkin and sunflower seeds contain any active laxative principles (claims made for these seeds by patients of Polish, Russian, and Czech origin). They do contain large amounts of cellulose, and a laxative effect may be due to these indigestible carbohydrates.

Gastric Resection Difficulties. The clinical manifestations, development, and treatment of undesirable anatomical and functional sequelae which may follow gastric resection are described. They include: failure of the gastric remnant to empty, retention of secretions of ingested food in the afferent loop, rupture of the duodenal stump, leakage at the "fatal angle of Billroth" or "corner of sorrow," internal hernia, the early and late postprandial dumping syndrome, marginal ulcer, gastroileal fistula, gastrojejunocolic fistula, stasis in a long afferent loop with a bacterial flora, iron deficiency and macrocytic types of anemia, and failure to regain lost weight.

Inspection for Trichinosis. There is a general impression that hog carcasses are inspected by the federal government for trichinosis and, if necessary, condemned. This mistaken opinion is partially responsible for the lack of effort to exclude the trichinous hog from the meat counter. Almost fifty years ago the Department of Agriculture abandoned all efforts to inspect pork for trichinosis on the grounds that no technique for detection was sufficiently accurate to remove all infected animals. This situation has led to an incidence in the U. S. of more than three times as much trichinosis as is known in all of the rest of the world, and apparently afflicts 15 to 20 per cent of our population. The entire problem needs re-evaluation.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 39, November, 1960

Absorption of radioactive sodium from the intestinal tract of man. I. Effect of intestinal motility. II. Effect of an organomercurial. V. W. Groisser and J. T. Farrar. —p. 1607.

*The lipid composition of serum in patients with liver disease. G. B. Phillips.—p. 1639.

*Zinc in human blood cells: Normal values and abnormalities associated with liver disease. R. E. Fredricks, K. R. Tanaka and W. N. Valentine.—p. 1651.

Serum Lipids in Liver Disease. The serum lipids, including the individual phospholipids, free cholesterol, cholesterol ester, and triglyceride, were analyzed in twelve patients with parenchymatous or obstructive jaundice; in three patients with cirrhosis without jaundice; and three patients with bile fistula. In the serum lipids of most patients with parenchymatous or obstructive jaundice, the triglyceride concentration was elevated, and in the patients with bile fistula. It appears that parenchymal liver damage depresses the serum concentrations of the phospholipids, free cholesterol, and cholesterol ester, while biliary retention tends to elevate the serum concentrations of lecithin and free cholesterol.

Zinc in Blood Cells in Liver Disease. Normal values for zinc in human leukocytes and erythrocytes are reported. A decrease of serum zinc concentration in cirrhosis is confirmed, and the evidence for disturbed zinc metabolism in these cases is extended by the finding of decreased intracellular zinc in the leukocytes. Erythrocyte zinc ranged from below to above normal in patients with cirrhosis, apparently varying directly with mean corpuscular volume. The biochemical

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and physiologic significance of zinc in leukocytes and of the disturbed zinc metabolism in patients with cirrhosis remains to be defined.

JOURNAL OF DAIRY SCIENCE

Vol. 43, October, 1960

*Effect of changing the fat and nonfat solids of milk. S. S. Wahid-ul-Hamid and L. J. Manus.—p. 1430.

*Symposium: milk solids-not-fat. G. W. Trimberger, B. L. Herrington, J. E. Legates, and others.—p. 1521.

Changing Fat and Nonfat Solids in Milk—Consumer Acceptance. The addition of nonfat dry milk to naturally skimmed milk has been found to increase consumer acceptance. Also it has been observed that there is no significant difference in consumer preference for a regular whole milk with 3.5 per cent fat and 8.5 per cent nonfat solids (NFS) and a milk adjusted to 2 per cent fat and 10 per cent NFS.

In this study, two panels were used —one of experienced judges, the other consisting of thirty-eight inexperienced individuals. Milk from mixed herds running 3.7 per cent fat and 9.2 per cent NFS was standardized to total solids (TS) as high as 15 per cent and fat as low as 2 per cent. Milks containing 2 and 3 per cent fat, each standardized to 12, 13, 14, or 15 per cent TS were preferred. No statistically significant differences in flavor were observed between 2 per cent and 3 per cent fat milks with 11 or 12 per cent NFS. Thus, by raising total solids of milk to 13 to 15 per cent, and keeping the fat at 2 or 3 per cent, consumer acceptance may be increased, at the same time, a desirable change in nutritional value accomplished, and a substantial reduction made in the annual surplus of nonfat dry milk.

Increasing Emphasis on Solids-Not-Fat. In pioneer days, our ancestors required high-calorie intakes. Then, high-fat milks were more highly rated than now. Cream consumption has been declining—30 per cent in fifteen years. Per capita butter consumption is half what it once was. It is advocated that milk be paid for on the basis of solids-not-fat (SNF) not on its fat content. The breeding and feeding of dairy cattle should be for higher SNF and lower fat. Research designed to yield more precise information in this area is needed.

JOURNAL OF HOME ECONOMICS

Vol. 52, October, 1960

*Nutritional explorations. A. F. Morgan.—p. 631.

*Future explorations in home economics. Foods. P. C. Paul.—p. 651.

*Children's attitudes toward food. D. T. Dudley, M. E. Moore, and E. M. Sunderlin.—p. 678.

Vol. 52, December, 1960

*Food-for-peace. D. Paarlberg.—p. 803.

*The recruitment story—how and where to tell it. A. Reichert.—p. 829.

Nutritional Status. From 1947 to 1959, cooperative regional researches on the nutritional status of selected population groups were conducted among the state Agricultural Experiment Stations. The resulting 178 scientific papers have been compared and the significant findings condensed into an integrated whole. These findings relate to food consumption, nutrient intakes, nutrient profile of the food groups, mean nutrient intakes, blood levels, underweight and overweight, and physical signs associated with deficiences. The nutritional status of the U. S., as measured by these studies, is quite good. Weak spots and incidence of low intake of minerals and vitamins are cited.

Future in Food Research. The study of food relates to many fields, such as chemistry, bacteriology, and intermediate fields, such as biophysics, mathematics, and agriculture. Food research started with analysis. Now our concern is with basic studies of the properties of food that affect their functional performance. Examples discussed are the jelling properties of starch, flavor evaluation, and tenderness of meat. The contribution of the home economist in this research, is speaking *for* consumers. The biggest problem is lack of trained personnel.

Children's Attitudes toward Food. Fifty-three preschool children at Iowa State University Nursery School were observed for their reactions to methods of vegetable preparation. Each child was offered a choice of four methods of preparation of each vegetable. Green beans, asparagus, carrots, and rutabagas were used. The children preferred raw carrots and rutabagas to any other method of preparation. With the green vegetables, *au gratin* preparations were rated over creamed. Preference here was more varied and not so consistent as with the yellow vegetables; buttered cut and buttered shredded or pieces of asparagus and green beans also rated high. These observations suggest that one should be cautious in making general statements that all children prefer certain preparations or that all children dislike foods prepared in certain ways.

Food-for-Peace. This is the largest foreign food distribution program the world has ever seen. It is a fairly elemental program, concerned with helping to supply hungry people with the additional calories needed both to stay alive and to push forward with the programs of development (India's third five-year plan is described) which promise better diets and higher levels of living for the future. Public Law 480, the Agricultural Trade Development and Assistance Act of 1954, is the chief instrument of Food-for-Peace and its provisions are explained. The cooperation of voluntary agencies, such as CARE, church organizations, and international organizations, is presented, as is the part of U. S. government agencies. Surplus food is being distributed in ninety-two countries and dependencies; 80 million people abroad get part of their food from this source.

Home Economics Recruitment. Each field of home economics has a story to tell to interest students and parents in career possibilities. Check lists are provided here which will help each professional specialist understand and explain her own and other fields. These check lists are included for research, extension service, health and welfare, home economists in business, home economists in homemaking, institution administration, and teaching.

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

Vol. 35, September 16, 1960

*Nutritional status survey of the rural population in Sholavaram. B. R. H. Rao, C. E. Klontz, V. Benjamin, P. S. S. Rao, A. Begum, and M. E. Dumm.—p. 259.

Nutritional Status in a South India Village. A nutrition survey was carried out in the South Indian village of Sholavaram, a rural population of 538 persons in 103 families being studied. Methods were the same as those used in a similar village, Pennathur. There was high incidence of conditions traditionally associated with nutritional deficiencies. In general, nutrition was inadequate with regard to protein, iron, vitamin A, and riboflavin. No good correlation could be established between clinical and biochemical findings.

JOURNAL OF J. J. GROUP OF HOSPITALS AND GRANT MEDICAL COLLEGE

Vol. 5, October, 1960

*A comparison of microbiological and paper chromotographic methods for the estimation of free amino acids in the body fluids. C. J. Mehta.—p. 257.

Estimation of Free Amino Acids in Body Fluids. Drawbacks to the microbiologic methods of determining the amino acids in body fluids are cited. Comparisons were made of this method with paper chromatography, using arginine, glycine, methionine, and proline. The quantitative paper chromatography method was superior when the concentration of amino acids was very low.

THE JOURNAL OF LABORATORY AND CLINICAL MEDICINE

Vol. 56, November, 1960

*Studies on the hemolytic principle of the fava bean. K. L. Roth and A. M. Frumin.—p. 695.

Serum Deficiency in Favism. Studies on the effect of three fava bean extracts indicated normal serum inhibits hemolysis, although the inhibitory factor was absent in the patient with favism (an acquired hemolytic anemia). This suspected serum deficiency may be an important factor in the study of favism.

THE JOURNAL OF NUTRITION

Vol. 72, December, 1960

*Availability to man of amino acids from foods. III. Threonine from corn. H. Linskwiler, H. M. Fox, and P. C. Fry.—p. 389.

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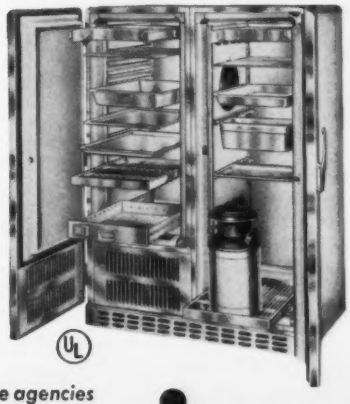

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*Availability to man of amino acids from foods. IV. Isoleucine from corn. H. Linkswiler, H. M. Fox, and P. C. Fry.—p. 397.

*Amino acid reference patterns: a comparison of the pattern of human milk with the FAO pattern in human nutrition. S. E. Synderman, L. E. Holt, Jr., and A. Boyer. —p. 404.

*Multiple amino acid supplementation of white corn meal. H. R. Rosenberg, E. L. Rohdenburg, and R. E. Eckert.—p. 415.

*Supplementation of bread protein with lysine and threonine. H. R. Rosenberg, E. L. Rohdenburg, and R. E. Eckert.—p. 423.

Amino Acids—Threonine. Two studies are reported which show that threonine in corn is completely available to man. The minimum daily requirement of threonine for young women has been reported as being 310 mg. Indication here is that it may be greater.

Amino Acids—Isoleucine. As in the case of threonine, isoleucine in corn seems to be completely available to human subjects. The isoleucine requirement seems to be greater than 422 mg. for women and men. Symptoms of isoleucine deficiency (mucous membranes are involved) developed within seven days with a daily intake of 222 mg.

Amino Acid Reference Patterns. In 1955, FAO described a "provisional" pattern of amino acids that would help in evaluating the protein quality of individual foods. The pattern was formulated to take into consideration a proper balance between the amino acids as well as meeting individual amino acid requirements. Seven premature infants were fed a synthetic diet in which the amino acids were provided in two ratios—that of the FAO pattern and that of human milk. There were no differences in the weight curves or the amount of nitrogen retained. The amino acid pattern of human milk would appear to be as satisfactory a standard of reference as the FAO pattern for assaying nutritional adequacy of protein.

Amino Acid Supplementation of Corn Meal. The supplementation of corn meal with graded amounts of lysine and tryptophan was designed to establish that combination of the two amino acids which elicits maximum attainable weight gain and maximum efficiency of food utilization. Maximum performance was predicted to occur at a ratio of 5.5 to 1 for lysine to tryptophan. Methionine, threonine, isoleucine, and valine were evaluated as a third limiting essential amino acid in corn. The addition of none of these singly improved the growth of weanling rats fed the corn meal diet supplemented with lysine and tryptophan.

Supplementing Bread with Lysine and Threonine. The responses of growing rats to various levels of lysine and threonine supplementation were studied using a bread of low-protein content. Optimal performance was calculated to occur at a ratio of lysine to threonine of 1.67 to 1. The study confirmed that threonine is the next limiting amino acid in bread protein after lysine.

THE LANCET

No. 7159, November 12, 1960

*The effect of test feeds on the plasma lipids. K. J. Kingsbury, D. M. Morgan, and P. C. Shervington.—p. 1045.

No. 7163, December 10, 1960

*The dumping syndrome: Clinical and radiological aspects. H. T. Cox and W. R. Allan.—p. 1261.

Effect of Test Feedings on Plasma Lipids. A method for the biologic assay of dietary lipids is described in which changes in the plasma glycerides, cholesterol, and phospholipids are measured after single 50-gm. feeding of the fat under investigation. Plasma samples are collected before and 1½, 3½, 5½, 7-9, and 24 hr. after the test feeding. The conditions for success are: a period of fat deprivation and a clear fasting plasma before the experiment; a standard method of feeding; the avoidance of nausea; and adequate absorption of the oil. The criterion of adequate absorption is a rise in plasma glycerides by more than 60 mg. at 3½ hr., of which increase over a third must have been removed by 5½ hr. The plasma cholesterol and plasma phospholipid changes produced are called the lipid response. This response differs with different oils, the characteristic changes being reproducible both in different subjects and in the same subjects after long intervals. The method has the advantage of needing only small amounts of material, of being quick and sensitive, of easily allowing experimental controls, and of not requiring special diets. It is not offered as an alternative to long-term experiment, but as a supplementary method.

The Dumping Syndrome. Dumping attacks after subtotal gastrectomy may be brought on by eating specific foods—milk, milk puddings, eggs, fatty foods, chocolates, and pastries. The symptoms are profound weakness and a feeling of light-headedness. A severe attack may totally incapacitate the patient. Walking, especially in a warm atmosphere and taking foods that are hot increases the severity of the attack. Radiologic examination during attacks showed stasis, dilatation, and no peristalsis, in the gastric remnant, duodenum, and jejunum. The appearance and disappearance of these changes coincided with the start and finish of the attack. The worse the attack, the more striking were these changes. Workers who used 50 per cent glucose solutions to reproduce symptoms like those of dumping suggested that hyperperistalsis is present in a natural dumping attack. These findings are unexpected and demonstrate the importance of investigating the natural dumping attack that follows normal food.

MEDICAL CLINICS OF NORTH AMERICA

Vol. 44, November, 1960

*Blood cholesterol and other lipds—their association with atherosclerosis. P. T. Kuo. —p. 1635.

Blood Cholesterol and Other Lipids. This paper reviews lipid transport and metabolism, indicating their application in diagnosing and treating persons having a predisposition to atherosclerosis or showing clinical manifestations of the disease. Laboratory methods for studying plasma lipoproteins are discussed. Clinical manifestations of atherosclerosis can be determined by measurement of simple cholesterol, phospholipid, and triglycerides in the plasma. The author feels the "normal" serum cholesterol levels for Americans are set too high. Abnormally high blood lipid levels should be controlled by low-fat diets and drugs. Exclusion of butter and meat fats and substitution of corn and cottonseed oil are favored. Heparin, niacin, thyroxin, triparonal are drugs used recently, although each has limitations.

MEDICINE

Vol. 39, December, 1960

*The kidney in gout. J. H. Talbott and K. L. Terplan.—p. 405.

The Kidney in Gout. Renal involvement is frequent in patients with gout. In two post-mortem studies, renal insufficiency was critical in 18 per cent of a larger series and 25 per cent of a smaller series. Except for the presence of urate deposits and surrounding giant cell reaction, no definitive histologic features were revealed in relation to mild or moderate clinical gout, severe tophaceous gout, or to the group associated with a blood dyscrasia. The only distinctive pathologic feature of the gouty kidney is the presence of urate crystals.

METABOLISM

Vol. 9, November, 1960

*Relative metabolic effects of calories, protein and an anabolic hormone (19-nor-testosterone) in early postoperative period. W. R. Webb, R. S. Doyle, and H. S. Howard.—p. 1047.

*Electrophoretic studies of serum protein in health and metabolic disorders. M. C. Nath and I. Vaishwanar.—p. 1058.

Postoperative Nitrogen Balance. The effects of varied caloric and nitrogen intakes and of an anabolic steroid, 19-nor-testosterone, on the postoperative metabolic response of forty-four male patients subjected to major pulmonary resections for tuberculosis were investigated. All nutrients were given intravenously for the first three postoperative days, on a nitrogen-free regimen; increasing the intake from 1100 to 2500 calories per day reduced only slightly the daily nitrogen loss, though weight loss was prevented when 2500 calories were supplied by intravenous carbohydrate and fat alone. At the sub-basal caloric intake of 1100 calories per day, 76 gm. hydrolyzed protein reduced the average daily nitrogen loss to about 4 gm. Nitrogen balance was achieved if the basal caloric needs were supplied, but

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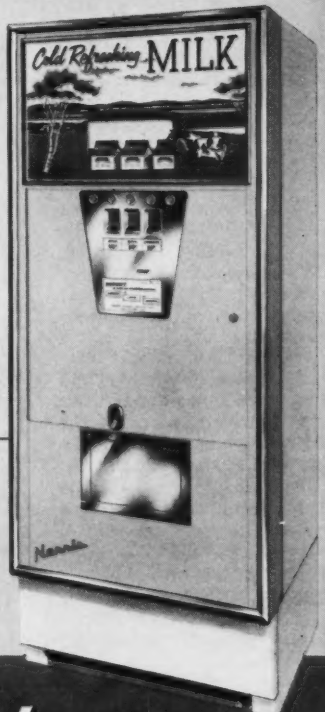

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increasing the daily intravenous protein intake to 187 gm. with the same caloric intake did not increase nitrogen retention. In the tuberculous patient, 19-nor-testosterone had only minimal anabolic effects on nitrogen metabolism and altered water and electrolyte balances insignificantly.

Serum Protein in Disease and Health. Electrophoretic studies on the serum protein fractions were conducted in Nagpur in Central India, on seventy normal men and sixty-six men with diabetes, coronary artery disease, essential hypertension, hypertension with cardiac complications, and kidney disorders. Hypoalbuminemia was found in all patients and was most marked in those with renal disease. The alpha$_2$-globulin was increased in all these diseases except essential hypertension, where the beta-globulin fraction was elevated. In normal subjects, albumin decreased with age and the globulin fractions increased correspondingly. The ratios of alpha$_2$-globulin to albumin, and of albumin to beta-globulin, are concluded to be better indexes for assessing metabolic disorders than the values for the different fractions alone.

NEW ENGLAND JOURNAL OF MEDICINE

Vol. 263, December 8, 1960

*Evidence for a defect in tryptophan metabolism in chronic alcoholism. R. E. Olson, D. Gursey, and J. W. Vester.—p. 1169.

Defect in Tryptophan Metabolism. The urine of sixteen normal and thirty-four chronic alcoholics was analyzed for 5-hydroxyindoleacetic acid (HIAA), xanthurenic acid, and N-methylnicotinamide before and after a load of 10 gm. DL-tryptophan. The excretion of 5-HIAA was significantly lower in the alcoholics than in the normal controls before and after the tryptophan load. Longitudinal study of four patients for periods up to four months indicated that the low level of 5-HIAA excretion was not changed by improved nutritional status or abstinence from alcohol. The urinary excretion of xanthurenic acid and N-methylnicotinamide was similar in both groups, suggesting that the kynurenine pathway is normal in the chronic alcoholic. These data suggest that the conversion of tryptophan to 5-hydroxyindoleacetic acid is preferentially depressed in chronic alcoholism.

NEW YORK STATE JOURNAL OF MEDICINE

Vol. 60, October 15, 1960

*Current concepts in diabetes mellitus. Pathology. J. I. Berkman.—p. 3284.

Vol. 60, November 1, 1960

Nutrition excerpts. Effect of food processing on nutritive values. W. B. Robinson and D. B. Hand.—p. 3452.

Pathology of Diabetes. There are no gross anatomic changes which are specific for diabetes. The nodular Kimmelstiel-Wilson lesion is the most reliable if not the only unmistakable anatomic landmark of this disease. Glomerular capsular hyaline deposits may have similar significance, as does diffuse glomerulsclerosis. Included among additional presumptive lesions are glycogen infiltration and degranulation of beta cells, shifts in the ratio of alpha to beta cells, advanced hyalinization of islets, severe degrees of sclerosis of afferent and efferent and glomerular arterioles, retinal capillary microaneurysms, massive hyaline thickening of tubular basement membranes, glycogen infiltration of liver cell nuclei, and glycogen infiltration of renal tubular epithelium.

NUTRITION REVIEWS

Vol. 18, December, 1960

*Introducing new foods against protein deficiency. F. T. Sai.—p. 353.

Combating Protein Deficiency. Protein malnutrition is prevalent in many parts of the world. Efforts are directed towards finding foods which may prevent it. Where milk, meat, and fish are not available, protein-rich vegetables must be used. Investigators all over the world are seeking a sufficiently good mixed-vegetable protein diet. Eight factors must be considered in preparing a satisfactory mixture: (a) amino acid composition of the protein, (b) toxicity, (c) storability in tropical climates, (d) ease of preparation, (e) cost, (f) acceptability and availability to the right groups, (g) education of government and medical personnel, and (h) educating the population.

PAPUA AND NEW GUINEA MEDICAL JOURNAL

Vol. 4, July, 1960

*Turtle meat poisoning. C. H. Campbell.—p. 73.

Turtle Meat Poisoning. Rarely, for some as yet unexplained reason, the meat of one species of turtle, the Hawksbill turtle, may become poisonous. Found in New Guinea waters, its toxicity may be due to the chance ingestion of poisonous coral fauna or vegetation. In cases reported, mortality is high. The poisoning appears to be a distinct clinical entity, unrelated to other forms of food poisoning. Symptoms are listed, and the course of the sickness described.

PEDIATRICS

Vol. 26, December, 1960

*Report. Committee on Nutrition. Composition of Milks.—p. 1039.

Composition of Milks. This article covers a report prepared by the Committee on Nutrition of the American Academy of Pediatrics on the composition of human and cow's milks. Human milk composition depends on the amount secreted, the stage of lactation, the timing of its withdrawal, and the individual variations among women. Cow's milk varies according to season of the year and the practice of pooling milk from an entire herd. In mature human milk, the fat content varies and affects the lactose content. It tends to become of more constant composition on the seventh day. However, no correlation could be found between milk yield and maternal diet, except that differences in diet may affect the volume. Linoleic acid, the only fatty acid known to be essential for babies, is considerably greater in human than in cow's milk, but the amino acid pattern of the protein of the two milks is quite similar. Radioactive elements—strontium, barium, iodine, and cesium—are now present in milk in varying distribution, with strontium the greatest hazard. Information on the "normal" variations of the two milks and their effects on the growth of the infant is not complete and further research and elucidation is needed.

PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

Vol. 105, October, 1960

*Electrocardiogram in hamsters after large fat meals. H. Nakamura and R. L. Swank.—p. 195.

Vol. 105, November, 1960

*Lymphatics in intestinal absorption of vitamin B_{12} and iron. P. G. Reizenstein, E. P. Cronkite, L. M. Meyer, and E. A. Usenik.—p. 233.

Fat Meals and Electrocradiograms. Hamsters were tube fed butterfat as cream, or oil and synthetic fat mixtures emulsified in skim milk. Amounts of lipid meals varied from 1.6 to 10 gm. per kilogram body weight. Electrocardiograms were taken at periodic intervals after each feeding. Prolongation of the QT interval, especially its ST segment, occurred. These changes were absent after oil meals. Hypoxia alone was not the cause of these changes, since they were reversed by injections of calcium gluconate. It is more plausible that the metabolism of large amounts of lipid contributed to changes by binding the freely available calcium. The presence of seizures was related to alterations in circulation and decreased availability of oxygen in the brain after fat meals. As yet, no direct relationship has been established between the mechanisms of convulsions and electrocardiographic changes which follow intake of meals high in fat content.

Mesenteric Lymphatics and Intestinal Absorption. Intestinal malabsorption may be due to obstructed mesenteric lymphatics and is often accompanied by disturbed absorption of vitamin B_{12} and iron. Transport of radio-iron and radio-B_{12} from the intestinal wall to the blood was studied in two dogs with cannulated thoracic ducts. Most of both substances was directly transferred into the blood rather than via the mesenteric lymphatics. Since large molecules are generally absorbed via the lymph, this indicates that the large B_{12}-intrinsic factor is split in the intestinal wall prior to transfer. Defects in the intracellular enzyme which splits the intrinsic B_{12} complex may explain the resistance to hog intrinsic factor in

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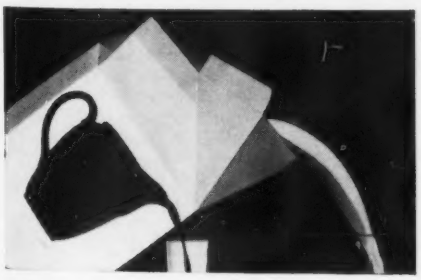

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patients. It is also possible that the time lag before B_{12} appears in the blood is explained by this splitting process in the intestinal wall.

SCIENCE

Vol. 132, 23 December, 1960

*Hormology in nutrition. T. D. Luckey and P. C. Stone.—p. 1891.

*Zinc-65 and chromium-51 in foods and people. R. W. Perkins, J. M. Nielsen, W. C. Roesch, and R. C. McCall.—p. 1895.

Hormology in Nutrition. Hormology places emphasis on the concept that stimulation of one or more systems by a compound or element does not make that compound or element an essential nutrient. This concept is the outgrowth of studies of the sodium requirement of crickets. The problem coming out of this study is how the hormetic action of an essential nutrient can be distinguished from its nutritive action.

Radio-Isotopes in Food and People. Several radio-isotopes are introduced into the Columbia River via effluent water from reactors at Hanford, Washington. These are found in crops irrigated with this water and in seafood harvested near the mouth of the river. Tables and data are included listing the concentrations of zinc-65 and chromium-51 in foods and in individuals consuming these foods. They are compared with zinc-65 concentrations resulting from nuclear fallout.

SURGERY, GYNECOLOGY, AND OBSTETRICS

Vol. 111, December, 1960

*Acute necrotizing colitis proximal to obstructing neoplasms of the colon. A. Hurwitz and R. A. Khafif.—p. 749.

Vol. 112, January, 1961

*Acid-base balance in surgical patients. II. The dynamic state of equilibrium. W. B. Crandell and G. H. Stueck, Jr.—p. 106.

Acute Necrotizing Colitis. Frequently acute necrotizing colitis occurs with carcinoma of the colon and will cause partial obstruction. Between 1950 and 1959 thirteen patients were observed at the Maimonides Hospital in New York City. As a result of these studies, the doctors feel that necrotizing colitis should be considered as a complication of carcinomas of the colon if pain, tenderness, spasm, presence of a mass, tachycardia, or hyperexia are present pre-operatively. If colitis is found, it is necessary to do further resection.

Acid-Base Balance in Surgery. A number of variable factors influence acid-base equilibrium in the extracellular tissue of a patient during anesthesia, operation, and convalescence. Of all the mechanisms which regulate balance, bicarbonate is of greatest importance. A number of factors regulate bicarbonate levels. Respiratory regulation is especially important, but renal regulation is also of significance. The influence on shifts in acid-base balance are strictly individual.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 29, December, 1960

*Forecasting food equipment for the sixties, Part 2. A. C. Avery.—p. 54.

Vol. 30, January, 1961

*Don't overlook the banquet business. F. B. Floore.—p. 44.

Forecasting Food Equipment. The biggest changes will be in kitchen and food service layout. Every effort will be made to have foods flow in the shortest possible straight line from storage to preparation, to cooking, to post-cooking storage or preparation, to food service. Little stock will be held on hand. All food materials will be handled at or close to waist height. Food going through a succession of steps will depend on gravity flow. In equipment, most of the tending, timing, stirring, and judgment will be done by mechanical and electronic devices. Steam-jacketed kettles will be smaller and more versatile. Ovens, deep-fat fryers, coffee urns, griddle, and refrigeration are due for improvements. Human engineering in kitchen design (efficient use of personnel, improved working conditions) is another big factor.

Banquet Business. At the University of North Carolina, a new system of menu selection has been instituted for the four private dining rooms catering to luncheon and dinner parties. Twenty entrée selections are available at each meal, with varying prices. Appetizer, salad, two vegetables, hot rolls, beverage, and dessert are selected by the dietitian (*not* the customer). This arrangement results in more attractive, appealing food selections, less variation in food production, lower food and labor costs, and less food waste. The importance of menu planning, the use of new recipes and up-to-date ideas is brought out.

THE CORNELL HOTEL AND RESTAURANT ADMINISTRATION QUARTERLY

Vol. 1, November, 1960

*Trends in union-management relations. R. A. Beck.—p. 4.

*The Fair Labor Standards Act. What it provides, how it is administered. S. Ganz.—p. 16.

*How to develop and communicate wage systems. H. B. Perrins.—p. 21.

*What we can do to attract and keep better personnel. A. Strohkorb.—p. 38.

*What we must do to attract and keep better personnel? M. Bernatsky.—p. 39.

*The essentials of good table service: a training manual.—p. 45.

Union-Management Relations. Developments in the labor-management field of the hotel industry, dating from the mid 1800's, are recounted. The present situation is analyzed, indicating that unions will ask for more pay, more fringe benefits, more paid holidays, more favorable legislation, and will try to organize new areas. Unions will encounter more resistance (cost-price squeeze), demand for higher production, increased mechanization, declining membership, and threatened withdrawal of Negroes to form their own unions.

The Fair Labor Standards Act. The major provisions of this Act, popularly known as the Federal Wage and Hour Law, are outlined. Explanation is given as to how the act is administered. Listed are over twenty publications of the Wage and Hour and Public Contract Division, U. S. Department of Labor, of most interest to the hotel and restaurant industry.

Wage Payment Systems. Suggestions are made for developing a wage payment system. Procedures of formal job evaluation (both non-quantitative and quantitative) are explained in technical terms. Setting up the rate structure and converting the job evaluation into wage dollars are also considered. Attention is given to aspects of communicating wage system to employers.

Attracting Better Employees. The food industry must consider these steps: (a) Bring employee wages and benefits up to acceptable standards. (b) Sell the industry to young people as a satisfactory career. (c) Provide adequate on-the-job training programs. (d) Develop better employee-management relationship through recognition of performance, promoting from within, and developing pride in the job.

Keeping Good Personnel. The average American views the service industries as offering jobs low in pay, dignity, and opportunity. The author lists seven points which "sell" advantages of careers in the hotel and restaurant industry. If all concerned would work toward presenting this true picture, and if more stress were placed on on-the-job training and upgrading titles, the personnel problem would vanish.

Good Table Service. This manual, developed for training waiters, deals with the following subjects: the headwaiter or hostess, the waiter or waitress, American service, French service, Russian service, banquet service, wine service, glassware, glossary of French terms, and dining room service check list. Comparison of the American, French, and Russian services is helpful. Detailed directions for preparing crepe Suzette are included. The many illustrations help clarify various points.

FOOD ENGINEERING

Vol. 32, December, 1960

*Poly-coated milk cartons.—p. 42.

*Freeze-drying—special report. J. V. Zimba.—p. 57.

Poly-Coated Milk Cartons. The manufacturing process for polyethylene-coated milk cartons is described. Plastic vinyl milk carton machines have been operating since 1949, but only recently have the quart and half-gallon units been introduced. Dairy men prefer them to the wax-coated containers.

Freeze-Drying. This process, changing frozen foods to the dry state by

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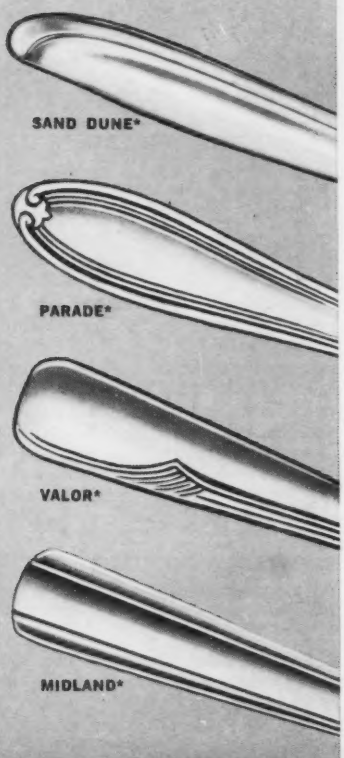

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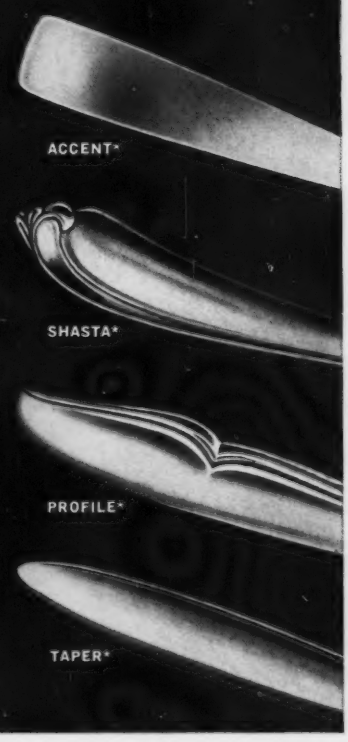

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When you are proud of your food and proud of your service, the surest way to tell your customers is to serve with **Solid Stainless by Oneida Silversmiths.** The smart patterns and the perfect balance of each piece are customarily associated with the finest in dining. Yet you get durability, ease of washing and budget-price. Ask your food equipment dealer or write . . .

Hotel and Restaurant Division

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sublimation, is being used more and more. Quality of products, advantages, and problems are cited. Food companies using the process are listed, along with their products. Manufacturers of the system are given, with descriptions of their set-up. The do's and don'ts of processing and packaging problems are noted.

FOOD SERVICE MAGAZINE

Vol. 22, December, 1960

*Fundamentals of hot food storage. D. W. Stewart.—p. 31.

Hot Food Storage. Two separate components are implied—storage immediately following preparation, conceivably for several hours; and temporary storage in the serving area, as on a cafeteria line. Bulk food containers are essential, and pass-through units are the most important adaptation of such equipment. Hot food tables and various types of containers are described and pictured, and the use of infra-red lamps is mentioned. A look at the future brings microwave cooking to the fore.

FROSTED FOOD FIELD

Vol. 31, December 1960

*Factors in frozen food quality. I. C. Feustel.—p. 22.

Frozen Food Quality. There are many opportunities for loss of quality in frozen foods even *before* they are frozen. The time from harvest to processing, over-blanching, and poor packaging are examples of such instances. Relation of temperature to storage is another factor. Examples of quality change resulting from temperature variation are cited.

HOSPITAL PROGRESS

Vol. 41, December, 1960

*Evaluating detergents (Part 2). T. D. Laughlin.—p. 96.

Detergents. Cleaning is explained in the light of the *p*H scale. Food soil which is slightly acid should be removed with an alkaline detergent, and vice versa. Frequency of "alternate" cleaning depends on the local water supply as it largely determines the mineral film problem. This article deals chiefly with germicidal agents (cleaning materials were the subject of part 1 of this series). The term "sanitizer" commonly denotes materials which have germicidal ability. Chlorine products, quaternaries, iodophor compounds, phenolic compounds, and the chlorophenol group—all sanitizers—are described. The place and problems of germicidal detergents (detergent-sanitizers) are presented and discussed.

HOSPITALS

Vol. 34, December 1, 1960

*Essential ingredient in kitchen routine—planned maintenance. C. H. Mattingly.—p. 82.

Vol. 34, December 16, 1960

*What's new in food service equipment. L. A. K. Frolich.—p. 95.

Maintaining Kitchen Equipment. Maintenance is difficult, since much of it must be done during off hours and involves specialized equipment. Guidelines are given for care of refrigerators (condensers, coils, and fans); disposal unit at the vegetable preparation area; ranges; steam cookers; exhaust hoods (both in cooking areas and over the dishwasher); mixers, grinders, and griddles; the dishwasher; conveyors on tray lines; and hot and cold food carts.

New Food Service Equipment. Built-in safety factors, mobile equipment, and automatically controlled devices for greater control of portions and quality are in the making. Container continuity, ovens, and steam cooking are areas in which improvements are seen. Safety devices for cutting and slicing equipment, for steam equipment, for counter-height coffee urns are described. Timing devices for deep-fat fryers and dishwashers are considered. Mobility of ovens, deep-fat fryers, refrigerators or shelving, and food carts is pointed out, too.

INSTITUTIONS

Vol. 48, January, 1961

*Institutions executives birds of a feather.—p. 7

*Sanitation for food service workers. T. M. Richardson.—p. 20.

*School lunch management. Part II. S. M. Hartt.—p. 29.

*How do your supervisors rate? R. D. Stevens.—p. 58.

Answers to baking problems.—p. 69.

*Auditors save restaurant profits.—p. 80.

Shorthand for the dietary staff.—p. 143.

Survey of Executives. A picture of the executive in the mass feeding–mass housing industry has been gained by a recent survey. He is overworked, averaged 54 hr. in a six-day week, and is responsible daily for 2300 meals, 580 beds, and 35 employees. His salary is $8000 per year plus an additional thousand for fringe benefits. Charts are included which stratify the total management group into three levels—top, middle, and supervisory, according to title and duties. Women dominate the middle management level, making up 59 per cent. This group is only slightly better paid than the lowest level and receives the smallest amount of fringe benefits; yet it has the highest level of education and more than twice the purchasing responsibility of supervisory executives. Indications are that any executive reaching the top in the next decade will have more energy, more education, more imagination, and more drive.

Sanitation. The first question posed is related to meat spoilage. Even though a refrigerator may be in good operating condition, frequent opening of the door and resulting temperature changes, too much condensation, and lack of air circulation may influence the development of molds and slime on meat. Ground meat will spoil rapidly if the grinder and mixer are not kept clean. The second question has to do with the control of staphylococcus infections in the hospital. The logical person to head a sanitation program for housekeeping personnel is the hospital housekeeper. This person would also take over the sanitation training of all food service personnel. The third question involves terminology. Should the terms "waiter" and "waitress" be discarded in favor of such a term as "sales people"? From the standpoint of morale, this impression is most important and they should be trained to "sell." Changing the terms as far as patrons are concerned would, however, be a long-term education job.

School Lunch Management. Although school lunch—as part of the instructional program of the school—can justifiably have its share of attention from the administrator and the teachers, management of the school lunch should be delegated to a qualified person. Advantages of the centralized system of management are readily seen: less highly skilled managers and supervisors would be needed in individual schools, training is better, less equipment and space are needed, labor costs are less. One factor to consider where an entire school system depends on a single unit of operation for its food is the availability of maintenance personnel for rapid repairs. The single school unit, vending machines for milk and snacks, home packed lunches, and table service (instead of cafeteria service) are also considered.

Rating Supervisors. Supervisory merit-rating plans give management a clear picture of which supervisors are below or above par, and afford a factual, non-emotional basis for discussing each individual's good and weak points with him. A merit-rating form is outlined.

Auditor for Your Restaurant. An auditor is prepared, professionally, to help a food service operator realize greater profits. Mistakes, fraud, and embezzlement are kept under control; one is better able to know his financial standing; an accounting system can be tailor-made for each restaurant; there is help on tax returns; and so on. Eight steps are outlined by which to locate a good auditor.

PERSONNEL JOURNAL

Vol. 39, December, 1960

*When in doubt, run and shout. T. T. Collins and R. Collins.—p. 266.

The Grapevine. The grapevine has always been a powerful means of communication, and its contacts which keep industry informed about new developments are of legitimate economic value. On the other hand, rumors can be a form of tyranny and can play on our fears, our prejudices, our suspicions and superstitions, until we have lost all common sense. Education and candor are the best defense in coping with rumors. Feed the grapevine facts so that you don't have to harvest sour grapes.

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PROFESSIONAL NURSING HOME

Vol. 2, December, 1960

*Ability to know your legal rights is good management requisite. R. D. Stevens and G. T. Medlock.—p. 10.

Vol. 3, January, 1961

*Sanitation aspects of patient food service. Sister M. Brigid.—p. 14.

Legal Rights and Good Management. Every day, legal problems are encountered which affect the relationship of employer and employee. The essentials of a legal employment contract are outlined. The question of liability to employees injured on the job and consequent difficulties or court action are explored. Presented are three special defenses which the employer may use. Ending of employment contracts is also discussed.

Sanitation in Food Service. Four areas which influence sanitation are explored: constant instruction, rigid control of methods and techniques, continual and firm supervision, and honest evaluation of techniques and results.

RESTAURANT MANAGEMENT

Vol. 87, December, 1960

*Keep customers comfortable—and coming back.—p. 45.

*Care and maintenance of stainless steel: Part V. Steam tables and bains-marie. R. E. Paret.—p. 50.

Vol. 88, January, 1961

*Equipment leasing. J. Black.—p. 58.

*Care and maintenance of stainless steel: Part VI. Flatware and utensils. R. E. Paret.—p. 60.

Restaurant Environment. Comfort and cleanliness are important to the knowledgeable patron. Creation of the proper environmental conditions is the job of the mechanical contractor. Temperature and humidity must be carefully controlled in the dining room, the bar, and the kitchen. Ventilation must be considered, too. Heat zone requirements, heating of large glass areas, hot water supply, and snow melting are also involved in an over-all plan.

Care of Steam Tables and Bains-Marie. Maintenance of these items is particularly important, since they provide the means to serve hot food properly. A chart is included which lists commercial cleaning agents, gives their method of application, and comments on effect on the stainless steel finish. Cleaning techniques are described, removal of heavy lime scale is explained, and procedures to avoid (particularly in scraping) are mentioned.

Equipment Leasing. To make food service equipment easier to buy, new credit lines are being investigated by all concerned. One of the newest and most complex of these credit systems is equipment leasing—a form of pay-as-you-go financing. A simplified lease contract, with qualifications, is presented as an example. The advantages of leasing are outlined; tax rulings are set forth.

Stainless Steel Flatware and Utensils. Proper cleaning of this equipment involves soaking, washing, rinsing, sanitizing, and drying. These steps may be accomplished by hand or with a dishwasher, the dishwasher being preferred. Instructions for carrying out these steps are given for both the hand method and the dishwasher.

SCHOOL LUNCH JOURNAL

Vol. 14, December, 1960

*New food products. S. R. Hoover.—p. 13.

*Design for student food service. P. Will, Jr., and C. Link.—p. 50.

*The seven "P's" to planning. J. Sonin.—p. 56.

Vol. 15, January, 1961

*Selling the school board on new equipment. J. H. Holman.—p. 24.

*Food values up—food costs down. L. Sublette.—p. 30.

*Cleanability of equipment surfaces. O. W. Kaufmann.—p. 40.

*The school administrator's responsibility for safety.—p. 47.

New Food Products. Such questions are answered as: "What do we eat?" "How much of our food is processed?" (There has been practically no change in the relative importance of commercially supplied fresh or raw foods in the total civilian picture.) "What do we gain by processing?" "What are important new foods recently developed?" (These include frozen concentrated orange juice, instant coffee, processed potatoes, and table-ready foods.) The final question involves products to come. Those described include dehydrofrozen vegetables and fruits, dried fruit juices, sweet potato flakes, dry whole milk, frozen meats, dehydrated meats, and high milk protein bread.

Student Food Service. Architectural design of school lunch facilities may be measured as follows: time to talk as well as eat + comfortable, hospitable seating + attractive, cheerful atmosphere + tasty, hot food = happy student customers. Efficiently managed kitchen and lunchroom areas + maximum percentage of student population participating in the lunch program = happy educational management. Relation of counter system to speed of service is discussed, seating arrangement is touched on (high school students like to group in fours and sixes), use of the cafeteria as a multi-purpose room is explained, atmosphere and decor (keeping budget in mind) are emphasized, and equipment and its arrangement for the best quality food service is stressed.

Lunchroom Planning. Successful planning involves preparation through observation; philosophy (importance of the lunch program to those involved); personnel (remembering that most employees are women and expressing this through color selections, size and height of equipment, etc.); purveyors (safety and convenience in deliveries); purpose (behind selection of equipment); and pride (in a clean kitchen, attractive food, contented employees, and satisfied customers).

Obtaining New Kitchen Equipment. Selling the school board on providing in the budget for adequate kitchen equipment means, first, educating them to the purpose, function, and operation of the school lunch. Suggestions are made as to how various pieces of equipment (scales, mixers, refrigerators, steam-jacketed kettles, dishwasher, and so on) can be "sold" to the members of the Board. Sanitation, time, labor, food quality, and advantages of long-range planning are among the selling points used.

Adequate, Low-Cost School Lunches. Twenty menus of adequate nutritive value and low cost were developed to be used in a number of schools in Mississippi, Alabama, and Tennessee. The problems encountered in the local situations in preparing the menus are summarized. Results of a study on food purchasing are analyzed and shortcomings noted.

Cleanability of Surfaces. Reviewed here are the results found by a number of workers on the cleanability of glass, china, stainless steel, plastic, and aluminum surfaces. Different types of soil and different types of organisms are considered.

Safety. The many aspects of school lunchroom safety are considered, and the role of the administrator is outlined. General safety suggestions are made regarding fire drills, emergency exits, discipline, refrigeration, equipment, and so on. Equipment, materials, and arrangement of food service areas are stressed. First aid rules are included, and directions are given for the use of insecticides.

THE SANITARIAN

Vol. 23, November-December, 1960

*Evaluation of mechanical dishwashing operations. F. H. Fiske and P. G. Stevenson.—p. 134.

*The problem of wooden and composition cutting board surfaces. S. Kinsman.—p. 140.

Dishwashing Operations. A total of 393 mechanical dishwashers in commercial establishments in the Denver area have been tested during the past two years to determine efficiency of utensil sanitation. A pyrometer and a pressure measuring device provide basic information on each machine. The mechanical condition of the dishwasher, the sizing of the hot water heating plant, and the operational practices of the personnel were determined. Deficiencies were found in a majority of the cases. Corrective measures are discussed and the need for greater educational effort stressed.

Cutting Boards. Wooden and composition cutting board surfaces present a sanitation problem, since abrasion, scouring, and porosity pose the greatest obstacles to proper cleaning and sanitization. A series of tests were made to determine: (a) physical effects of the usual treatments involved in cleaning; (b) effectiveness of cleaning and sanitizing treatments; (c) possible leaching out of components under experimental conditions; and (d) knife dulling characteristics of each surface studied. Tested were a maple board, an impregnated birch board, and a government rubber-sty-

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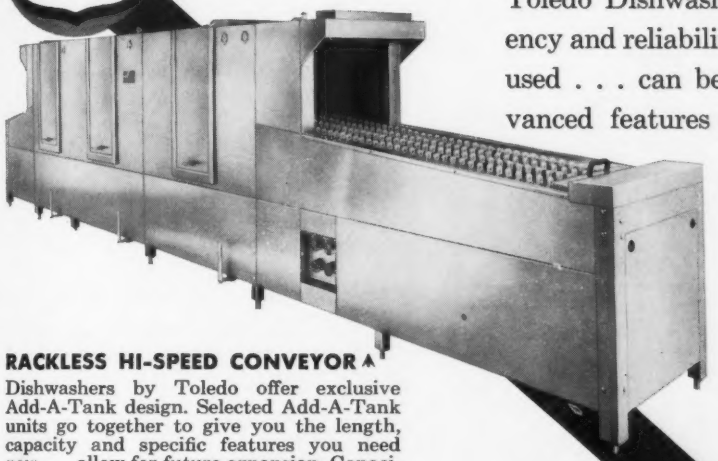

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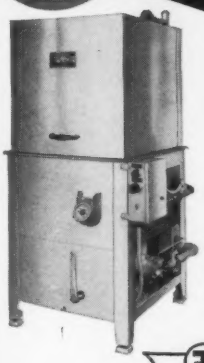

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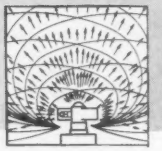

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rene meat cutting board. In relation to the five tests made, none of the boards approached a desirable surface finish.

MANAGEMENT METHODS

Vol. 19, November, 1960

*Workshop for management.—Don't be too easy going.—p. 30.

*How to write better. A. M. Joseph.—p. 43.

*How to double or triple your reading speed. Part 1. The Reading Laboratory, Inc.—p. 46.

Vol. 19, December, 1960

*How to double or triple your reading speed. Part 2. The Reading Laboratory, Inc.—p. 50.

*How to halt a communications parade. B. A. Stein.—p. 52.

*Does your plant invite theft? W. S. Burns.—p. 55.

How to Be a Good Leader. Some executives are so concerned with being well liked that they lose out on gaining respect from their subordinates. It takes a certain amount of iron to be a good leader, and it takes firmness to be a capable executive. Some points to consider in effective leadership with employees include: (a) Does it take coaxing and persuasion to get a job done? (b) Is procrastination easier than reprimanding? (c) Are you afraid to say "no"? (d) Do you give in easily? (e) Do you worry about whether people like you? If the answer is "yes" to these questions, the author warns that there is too much concern for personal popularity and suggests, "Tighten up, be forceful. Be fair but not lax with workers."

Improving Your Writing. The biggest waste in business and industry today is the waste of executive manpower through bad writing. This waste does not end, however, with misunderstandings brought on by poor communications through writing. Valuable time is lost, too, because it takes an executive much longer to ponder a way to say something in a flowery manner than to write simply and clearly. Furthermore, long flowery writing takes the recipient much longer to read. Ironically, the most common writing fault in business is also simplest to correct: over impressiveness. People are seized by an urge to show how smart they are and to impress others, not realizing that dignity comes from *what* they say, not *how* they say it. Six principles of clear writing which not only make writing easier to read, but easier to write also, are listed. The author further emphasizes the importance of logical organization in writing and suggests that a good method is to include conclusions first, thus giving the reader your opinion first and then stating the reasons for these conclusions.

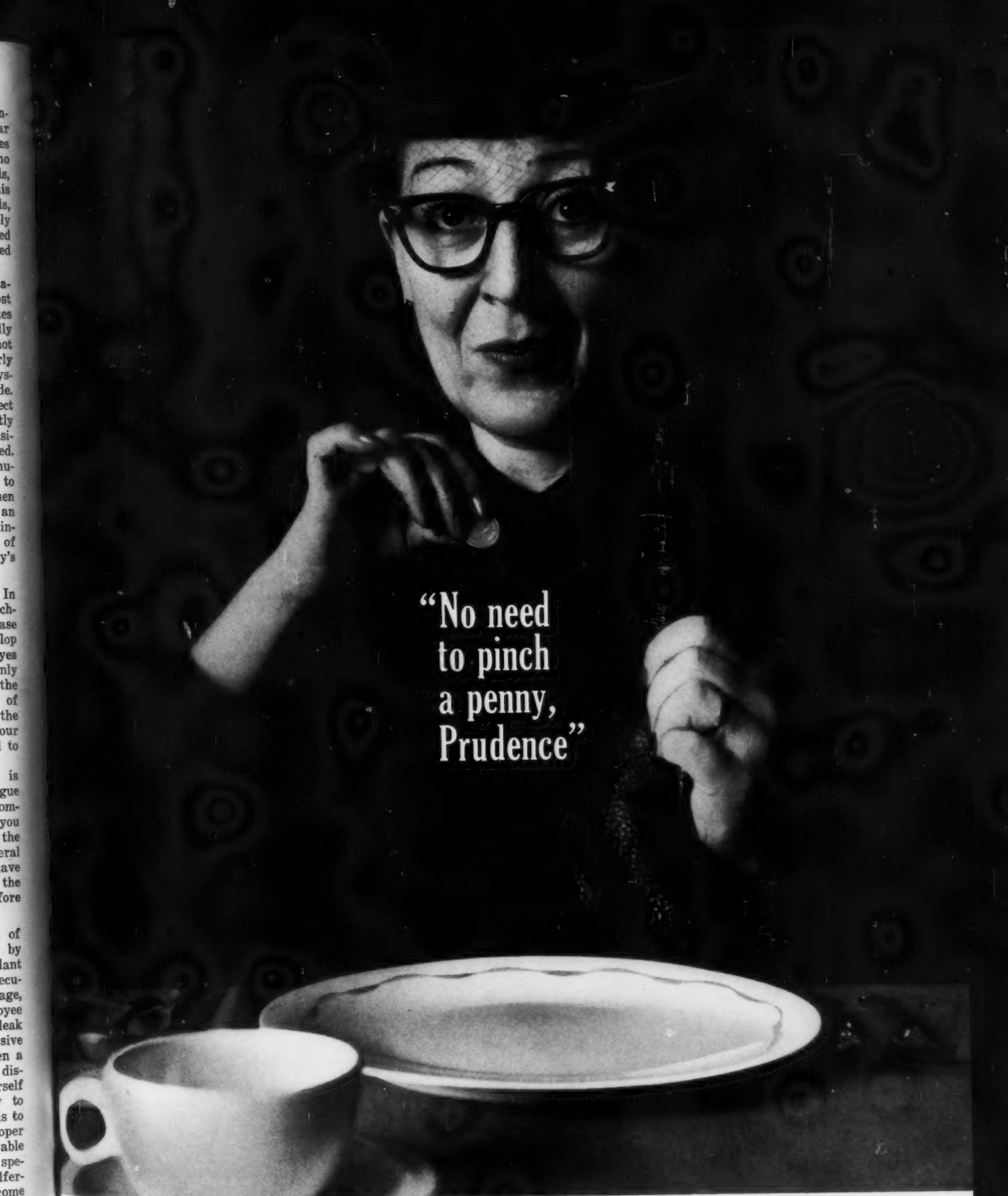
Speed up Your Reading. A five-part series of short lessons has been prepared on improving reading skills to save executive hours. The average business person reads about 250 to 300 words a minute. By using techniques illustrated in this series, the average executive can easily improve reading speed 100 to 150 per cent or more. Also, as speed increases, comprehension too, is increased. Early grammar school training developed three types of readers: the motor reader who forms words with his lips as he reads, the auditory reader who hears in his "mind's ear" the words as he reads, and the sight reader who immediately gathers information from the printed page. Reading skills can be developed and improved.

Internal Communications Halt Parade. Footsteps in any business cost money. Continuous movement makes people look busy, but analysis usually shows that people on the move are not getting much done. With a properly designed internal communications system, there is no reason for the parade. By engineering systems to connect only those people who must constantly be in touch with one another for business purposes, gossiping is minimized. To check a company's existing communications system, the best place to start is at the switchboard and then the office traffic must be studied. If an internal communications system is installed, be sure that it is capable of expanding to meet the company's foreseeable growth.

Accelerate Your Reading Speed. In the first article of this series, a technique for faster reading called "phrase reading" was discussed. To develop an awareness of phrases, let the eyes move down a column of type with only one fixation per line. Try to see the first and last words of each line of type while looking directly down the center. Chant numbers through four while reading to direct your mind to what your eyes are reading.

A good reading environment is necessary to eliminate eye fatigue and visual strain. Don't be too comfortable; a little tenseness helps you to stay alert. Adjust your pace to the purpose. As an automobile has several gears for several purposes, so have you. Learn to adjust rapidly to the nature of the reading material before you.

Protective System. Thousands of dollars can be saved annually by installing tight controls through plant protective systems. Good plant security protects against: (a) pilferage, (b) collusive theft, (c) employee carelessness, (d) sabotage, (e) leak of company secrets, and (f) extensive fire or water damage. All, or even a majority, of workers are not dishonest, but you must protect yourself against the minority. One way to guard against internal pilferage is to remove temptation through proper storage and protection of movable material. Many firms are hiring special undercover workers to spot pilferage. To be effective they must come in through regular employment channels and few senior executives should know their identity. If you think undercover work is unethical, ask yourself: is pilfering unethical? The author includes a check list to test your plant for security.



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AMERICAN CYANAMID COMPANY, PLASTICS AND RESINS DIVISION, WALLINGFORD, CONN. CYANAMID

New Departments at A.M.A. Two new departments have been created within the Division of Scientific Activities of the American Medical Association. The former Department of Foods and Drugs has been separated into two, the Department of Foods and Nutrition and the Department of Drugs. Philip L. White, ScD., who previously served as Director of the combined department and Secretary of the Council on Foods and Nutrition, has taken over as Director of the new Department of Foods and Nutrition. The Council on Foods and Nutrition will be served by the staff of this new department.

FDA Information Program. The appointment of Lala J. Curry as Consumer Education Specialist for the Food and Drug Administration was announced in January. Miss Curry will develop and direct a new consumer education program for the FDA which is being initiated particularly in response to the many requests for information received by the FDA from students and high school teachers. Miss Curry's most recent assignment was in Monterrey, Mexico, where she organized and directed for several years, the first professional home service department for food products in that country. She has also edited consumer material for General Foods Corporation and been a member of the home economics staff of General Electric Company.

The following foods are included on the USDA's list of plentiful foods for March:

Protein foods
Eggs
Milk and dairy products
Peanuts and peanut products
Other foods
Cabbage
Cranberry products
Dates
Rice
Ripe olives

Frozen Foods in March. From the National Association of Frozen Food Packers come the following suggestions for foods especially suited—cost-wise and menu-wise—to serve in March.

Frozen Fruits

APPLES—Frozen apples are delicious fried; or, use cinnamon- or lemon-flavored applesauce to enhance the appearance of pork. Apple fritters are excellent specialty items for either breakfast or lunch.

BLACKBERRIES—Fresh-baked blackberry torte or blackberry cobbler with cream makes "mighty good eatin'" for dessert.

PEACHES—Peach halves for dessert delight calorie-counters and people who just like peaches; or, serve frozen peach slices on cereal.

Frozen Vegetables

ASPARAGUS—A winner for dinner any time; for luncheon, serve as the entrée on toast with cheese sauce.

CORN—Combine with other vegetables, such as green or Lima beans or tomatoes; or serve alone, with a little butter or margarine.

MIXED VEGETABLES — Give casseroles fresh color; also an easy-to-serve vegetable choice to brighten a meat-and-potatoes plate.

SPINACH—With frozen spinach, the problem of sand and tough stems is eliminated.

Frozen Prepared Foods

These are now available for quantity service in aluminum containers which fit in steam table compartments, as well as individual-serving casseroles and a heat-in-the-bag form.

Dedication of New Home Economics Building. On March 23 and 24 at the University of Missouri, Columbia, Stanley Hall—a new wing of the Home Economics Building—will be dedicated. Named in honor of Louise Stanley, the program will include a dinner on March 23, at which the featured speaker will be A. June Bricker, Ph.D., Executive Secretary, American Home Economics Association. At the convocation the following day, James Hilton, President, Iowa State University, will speak. This program will be followed by a recognition and awards lunch, with actual dedication taking place in the afternoon. Tours of the new building will be conducted on Friday, March 24. Home economists, students, alumnae, and friends are invited to attend this event.

Special Summer Courses. At *Michigan State University*, a five-week seminar, June 12 to July 26, will be presented on the role of unions in food service operation. Special consideration will be given to a brief overview of the history of labor relations, the current status of labor laws, and on-the-job conduct required of supervisors who have direct contact with employees. The course will carry 2 term credits.

* * *

A four-week course in problems in group feeding will be offered June 19 to July 14 at the *University of Illinois*. The modern Home Economics Cafeteria, in which food for 285 persons is prepared each noon, will serve as the laboratory for the teaching of basic quantity food production and management techniques. The course may be taken either for 3 credits of undergraduate work or ½ unit of graduate work.

Meetings. Food Service Industry Short Course, *University of Missouri*, Columbia—March 14 and 15. Theme: "Leading the Way to Profits."

National Health Forum, Cleveland—week of March 19. Theme: "Accident Prevention and Emergency Care."

Conference sponsored by *Public Affairs Committee, Inc.*, in celebration of its 25th anniversary, New York City—March 24. Theme: "The Years of Challenge."

45th annual meeting of the *Federation of American Societies for Experimental Biology*, Atlantic City—April 10 to 14.

Eastern States Health Education Conference, New York Academy of Medicine, New York City—April 27 and 28.

National Restaurant Association convention, Chicago—May 22 to 25

Fourth Annual Meeting of the *Nutrition Society of Canada*, Ontario Agricultural College, Guelph—May 30

Catholic Hospital Association convention, Detroit—June 12 to 15

52nd annual meeting of the *American Home Economics Association*, Cleveland—June 27 to 30.

Government Publication. From the Children's Bureau comes a new booklet, *Food for Groups of Young Children Cared for During the Day*. Prepared by Helen M. Hille, the Bureau's Institutional Nutrition Consultant, it is concerned with the problem of helping children develop good eating habits and pleasant associations with eating. The problems of selection and service of food are also considered, of course. The contents include sections on: developing good eating habits, meeting food needs, food purchasing, food storage, food preparation, food costs, and safe food service. Copies of this fifty-eight-page booklet (Children's Bureau Publication No. 386) may be ordered from the Government Printing Office, Washington 25, D. C., for 25 cents.

Publications of Interest. The November-December 1960 issue of *Nutrition Committee News* (published by the USDA's Institute of Home Economics) was devoted to "'Do-It-Yourself' Posters Teach Nutrition." Information was adapted from an address made before the American School Food Service Association by Dr. Mary Hill. Topics include: collecting ideas; planning storage; choosing, adapting, and mounting pictures; use of cardboard food models; lettering; assembling posters; perforated cardboard posters; and sources of assistance. A copy may be requested from the USDA.

* * *

A revised edition of *Training Restaurant Sales Personnel* will soon be available from the U. S. Office of Education, according to an announcement from the National Restaurant Association. Gertrude Blaker, School of Ho-

A younger person may not realize and the older person may have forgotten. But . . .

Since 1941, practically all white bread, flour, processed cereals and macaroni foods in U. S. diet have been enriched with specified amounts of thiamine, niacin, riboflavin and iron. Since 1941, deficiency diseases due to diet inadequate in these three B-vitamins have all but disappeared. Today clinical signs of beriberi, pellagra and ariboflavinosis are hard to find. In addition, the incidence of iron deficiency anemia has been reduced.

Cause: enrichment. *Effect:* improved public health . . . a quiet miracle in applied nutrition. Today 80 to 90 percent of all white bread, family flour, cereal products and macaroni foods are enriched. Today these foods are so good nutritionally that any normal diet can be improved by eating them.

For further details on the quiet miracle and what it means to you, fill in the coupon:

The nutritional statements in this advertisement and the literature it makes available have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current, authoritative, medical opinion.

ENRICHED . . .
and whole wheat flour foods are listed among the "Essential Four" food groups set up by the U.S. Dept. of Agriculture's Institute of Home Economics. Diet selected from these foods provides ample protein, vitamins and minerals.

WHEAT FLOUR INSTITUTE
working for a healthier America through nutrition

FREE – USE COUPON OR SEND Rx BLANK

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309 West Jackson Blvd., Chicago 6

Please send me for professional review copies of the National Research Council pamphlet, "Cereal Enrichment in Perspective," and "The two minute story of THE QUIET MIRACLE," for possible professional distribution in quantities. (Please print)

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ADDRESS_____

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(Distribution limited to U.S. and possessions)

tel and Restaurant Management, Michigan State University, has authored the new manuscript, which will cover cafeteria and drive-in service, as well as procedures of table service.

* * *

The California Department of Public Health, Berkeley, has recently issued *Standards and Recommendations for Public Prenatal Care* and *Nutrition During Pregnancy and Lactation.* The *Standards and Recommendations,* adopted on July 1, 1960, were prepared with the advice and help of many individuals concerned with prenatal health. The booklet, *Nutrition During Pregnancy and Lactation,* serves as a supplement. It covers practical aspects of nutrition during normal pregnancy and lactation and has been prepared primarily for the use of professional groups. Copies of both booklets are available to professional health workers on request.

TV Series Available. A series of twenty-two, ½-hr. TV programs on the theme, "Food for Life," will be available for showing on educational stations in June. Planned to counteract the flood of misinformation stemming from mass media and "health" salesmen, the series was originally presented last year by Dena Cederquist, Ph.D., Head, Foods and Nutrition Department, Michigan State University, and aired over WMSB-TV, the MSU educational station.

At the time of the original presentations, video tapes were made, which are now the property of the National Educational Television network. Showing the programs is optional, and the manager of each network station has the responsibility of accepting or rejecting the series. Anyone interested in having the series shown might contact the manager of his local educational station to urge him to handle the tapes. Scheduling decisions are made about six months in advance.

A list of the subjects for the twenty-two programs is available from the Department of Information Services, Cooperative Extension Service, Michigan State University, East Lansing.

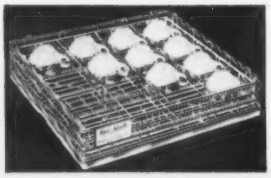
DOUBLE PROTECTION PAYS!

For really full time protection of china and glassware, get the double protection of Sani-Stack racks.

Sani-Stack's exclusive "Straight 8" frames stand firm against bruising everyday abuse. Extra side and bottom bracing helps Sani-Stack racks keep their shape and provides safe, positive stacking. For uniform strength every joint is perfectly welded on automatic equipment.

Within the rack the shock absorbing insert cradles individual pieces in separate compartments. Metro's special formula plastisol, bonded permanently to the insert, cushions pieces and soaks up disturbing clatter.

The double protection of Sani-Stack racks can save you as much as 50% in breakage!



See for yourself how Sani-Stack's double protection reduces the expense of china and glassware replacement. Send for FREE folder "The Sani-Stack System." It shows how to save money in dish handling.

Over 30 years experience solving your dish handling problems.

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A quality product of

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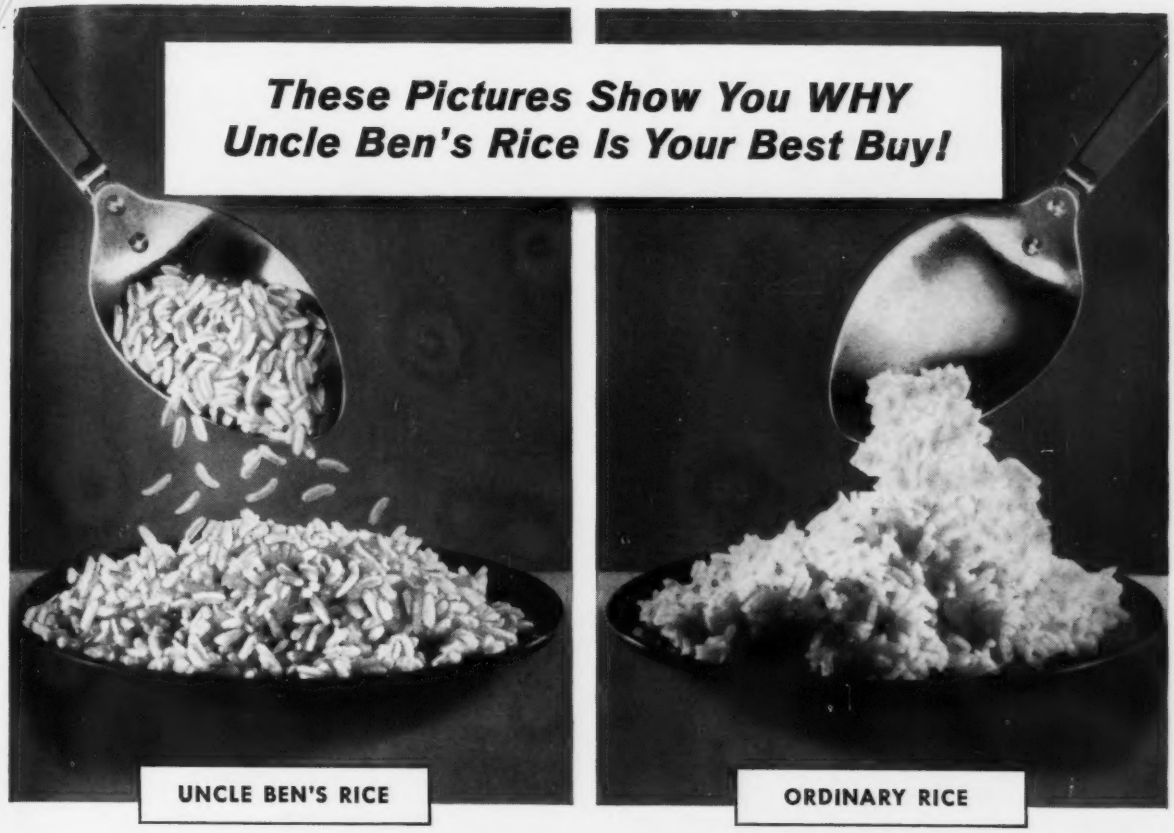
Supervisory Development Film. "Breaking the Delegation Barrier" is the title of the sixth film on supervisory development to be released by Roundtable Productions, 275 South Beverly Drive, Beverly Hills, California. This 30-min. film is intended for use in helping supervisors overcome their fear of delegating authority and responsibility to subordinates. The plot involves a company faced with expansion and a rush contract. Authority was delegated to three department heads, each of whom almost fails to meet the contract deadline due to his fear of delegating work. In each case, the film shows how fear was overcome and the process of delegation was able to benefit the company, the supervisors, and workers. Further information may be obtained from the producer.

Regulations on Smoked Meat Products. The USDA has revised regulations governing preparation of smoked hams and other cured pork products to permit the production and marketing—under Federal meat inspection—of some of these products with not more than 10 per cent added moisture. Meats affected include: smoked hams, pork shoulders, pork shoulder picnics, and pork shoulder butts. Still in force, however, are regulations prohibiting any added moisture in smoked tongues and in smoked or unsmoked cured meats labeled as cooked or ready-to-eat. The limitation of 8 per cent added moisture in canned hams and other canned pork products also remains unchanged.

The revised regulations will permit packers with federally inspected plants to meet a growing consumer demand for juicier smoked meats.

Japanese Nutrition. Early in January, the editorial office received its copy of *Nutrition in Japan—1960,* issued annually by the Japanese government's Ministry of Health and Welfare. In its forty pages are crammed concise facts about Japanese dietary intake for each year from 1946 up to and including 1959; tables of heights and weights, with figures for seven years according to age, and data for 1959 according to occupation;



UNCLE BEN'S IS THE SEPARATE-GRAIN RICE

Never Sticky or Gummy!

- Reheats beautifully after refrigeration!
- Never Mushy even after hours on the Steam Table!
- Gives up to 23% more servings per pound!

COSTS NO MORE PER SERVING THAN CHEAPER RICES
(Actually less than 1¢ per serving!)

It's the portion cost that counts! For example, a 100-lb. bag of Uncle Ben's yields up to 1,920 half-cup servings—approximately 360 more servings than cheaper rices. It's these extra servings that lower your portion cost. As a result, Uncle Ben's costs no more per serving than ordinary rices . . . ACTUALLY LESS THAN 1¢ PER SERVING!

For **FREE** Quantity Recipe Cards, write:
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P. O. Box 1752,
Houston 1, Texas

Uncle Ben's *Golden* Rice

mass feeding, including school lunch service; enriched foods; the "nutritional requirements" for Japan as set forth by the Council of Nutrition; training facilities and national examinations for nutritionists; research in nutrition; as well as nutrition activities of private organizations.

Protein intake in Japan has steadily decreased in the last decade, although intake of animal protein is markedly increasing, and in 1959 went over the 30 per cent level of total protein for the first time. Fat averages 23.8 gm. per day nationally. Concern is expressed about a decrease in thiamine intake, because of the danger of increased beri-beri. Height and weight figures indicate that, after a decline in the immediate postwar years, the Japanese physique has "recovered" to its prewar status, and in 1959, the averages even went a little above prewar figures. Not content with only the enrichment of rice or bread in a rice-eating country, the Japanese government has also established standards of enrichment of wheat flour, dried noodles, *miso* (bean paste), jam, soup cubes, canned fruit, cookies, caramel, candy drops, fruit juice, and margarine.

In 1960, the Council of Nutrition revised its table of "Nutritional Requirements" for the Japanese including: an increase in the calorie recommendation for youth: an increase in the figures for protein: a decrease in the calcium requirement (intake has never reached the previous "requirement," yet calcium deficiencies have not yet appeared. Thus, the requirement was lowered in line with realities); and a reduction in the vitamin A activity of carotene from half to a third of total vitamin A, since the carotene absorption rate has been ascertained to be one-third that of vitamin A. These nutrient requirements are translated in food "requirements," and a table giving revised "required" weights for various food groups is presented, as well as the table on nutrient "requirements" according to age, sex, and activity.

Frozen Apple Juice. Market tests of a new frozen apple juice super-concentrate (6 to 1 density) have indicated high commercial sales possibilities. The new superconcentrate, developed by the USDA's Agricultural Research Service, were market-tested for ten weeks in Ft. Wayne. Most of the consumers who used the new product praised its flavor; few commented adversely. The high-density concentrate was not inconvenient to reconstitute, according to the homemakers, and it outsold all other canned and bottled apple juices in the supermarket studies. Of special interest to the apple industry was the fact that this product attracted a majority of users in families that were not using any other apple juice.

Cafeteria Counters • Memorial Union Building • Purdue University • Lafayette Indiana

Architects: Walter Scholer & Associates

Van equipment has served schools and colleges for half a century

• This Van name plate on much equipment for the preparation and serving of food is evidence of its satisfactory service on many campuses. Van engineers assist personnel of colleges and their architects in planning to co-ordinate activity and effort to meet the needs.

• Illustration shows two U-shaped lanes of cafeteria service in the Memorial Union Building at Purdue where five counters serve 6000 meals daily . . . *close to two million meals annually* . . . in which Van's work in engineering and equipment was done in 1952 and 1960.

• *Call Van engineers in early* when you need food service equipment.

The John Van Range Co.

EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD

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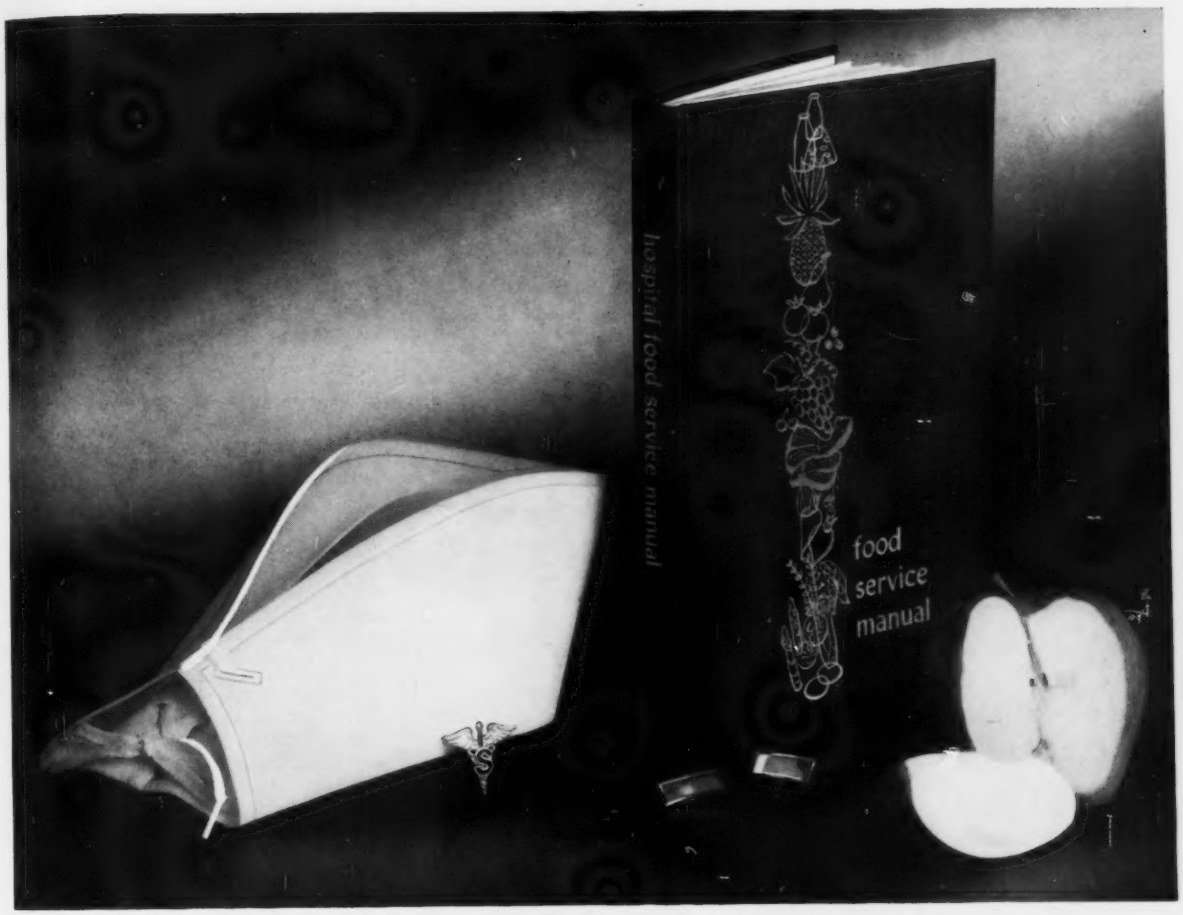
News of State Associations

District of Columbia. March 4 to 11 has been proclaimed by the District of Columbia Commissioners as "Dietetics Week." During this time, a concerted effort will be made to publicize dietitians and careers in dietetics through newspapers, television, and radio.

Delaware Dietetic Association. A communications seminar was held February 24 and 25 in Dover, under the joint sponsorship of the Delaware Dietetic, Home Economics, and Vocational Associations and the University of Delaware Extension Service.

On December 3, the Delaware Dietetic Association participated in a career day program at the P.S. duPont High School. An exhibit on "Dietetics as a Career" was used, as well as "hand-out" materials. The filmstrip, "Take a Good Look," was well received. The event was sponsored by the Delaware League for Nursing.

Georgia Dietetic Association. On January 9, the *Atlanta Dietetic Association* devoted its program to civil defense. Major Nannie Evans, AMSC, U.S. Army Recruiting Officer, spoke on "Current Trends of Civil Defense Activity in the Various States."



THE DOOR IS OPEN TO GRADUATE STUDIES IN DIETETICS

THE ARMY MEDICAL SERVICE now offers qualified dietitians the opportunity to complete studies leading to the Master's degree. Through the Graduate Dietitian Program, accepted candidates receive an officer's pay and allowances while studying at a college or university of their choice. The major field of study may be Foods and Nutrition, or Institution Management.

Upon selection for this program you are commissioned in the Army Medical Specialist Corps Reserve. Appointment may be as 2nd or 1st Lieutenant, depending on your qualifications and length of experience. After completing your studies, you are assigned to the staff of an Army hospital.

As an officer dietitian you enjoy the pay, prestige, and privileges of your rank. Every year you earn a 30-day vacation. At the same time, you have opportunity to develop your professional abilities and advance in rank.

ARMY MEDICAL SPECIALIST CORPS

PROGRAMS FOR STUDENT DIETITIANS

STUDENT DIETITIAN PROGRAM. Junior or senior college students who qualify for this program can complete their studies while earning over $200 a month.

DIETETIC SUMMER PRACTICUM. Students due to complete their junior year at college can gain practical experience in this 6-week hospital program.

You are invited to mail the coupon today for more information about the Graduate Dietitian Program, or the Student Programs.

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Washington 25, D. C.

JADIA-3-61

Please send details about the AMSC program(s) checked below:

☐ GRADUATE DIETITIAN PROGRAM
☐ STUDENT DIETITIAN PROGRAM
☐ DIETETIC SUMMER PRACTICUM

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City_____ Zone____ State_____

Minnesota Dietetic Association. The Community Nutrition Section's special project this year is to combat food fads and promote dietetics. To this end, in cooperation with the Women's Auxiliary of the Minnesota Medical Association, it will co-sponsor a series of showings of the A.M.A.'s motion picture, "Medicine Man," to community and civic leaders throughout the state. It is hoped that they, in turn, will show the film to their respective groups.

New Jersey Dietetic Association. As a follow-up project this year, the Diet Therapy Section is attempting to make an evaluation of the New Jersey Diet Manual which was prepared in 1959. In October, the state Department of Health mailed an evaluation sheet to each of the 3000 physicians who has requested a copy of the Diet Manual. Late in November, the Dietetic Committee met with representatives of the Department of Health to review the 700 replies received. While the physicians were generous in their praise of the Manual, the evaluations brought to light several needs which will be valuable in preparing revisions.

In December 1960, the New Jersey Association "stepped up" from a mimeographed bulletin, to a printed, four-page publication.

The *North Jersey Association* is proud of the recognition it has received for its exhibit which was shown last spring at the Essex County Health Fair, sponsored by the county's Inter-Professional Health Council (the North Jersey Association is a member). The Association has received an engraved plaque for second prize in the educational class among the exhibits shown at this Fair.

Pennsylvania Dietetic Association. On April 5 and 6, the Pennsylvania Dietetic Association will co-sponsor with the Hospital Association of Pennsylvania and the Pennsylvania State University an institute for administrators and dietitians. (Joint registration by the hospital administrator and dietitian is the goal.) The program will be planned to: (a) examine the direction of the change in hospital food service operations; (b) broaden the understanding of the role of the hospital dietitian in the future; (c) promote effective cooperation between the hospital administrator and dietitian; and (d) appreciate and utilize the professional skills of the dietitian to the best interest of the patients and the hospital community.

On April 15, the *Philadelphia Dietetic Association* will be the hostess club for the annual Friendship Fete sponsored by the Philadelphia Federation of Women's Clubs. The theme will be "Food, The Link of Friendship," and will be carried out with a menu of international flavor and an address by Dr. Ruth Leverton of the USDA's Institute of Home Economics.

The Community Nutrition Section of the *Pittsburgh Dietetic Association* has prepared and submitted a reading list to the Carnegie Library. This bibliography includes nutrition books suggested for reliable information and easy reading.

South Carolina Dietetic Association. To the South Carolina Association, we believe, goes the distinction of publishing the first state bulletin with a four-color cover. The winter 1960 issue of *The Palmetto Leaf* carries a spectacular cover picture of fall color.

Career Guidance in the States

From the number of state bulletins received by your Career Guidance Chairman, we note a marked gain in the number and variety of career guidance activities publicized compared with last year. In sixteen bulletins, there were twelve articles with prominent career guidance headings, and twenty-two additional "meaty" references to career guidance plans and achievements. Only three bulletins did not mention the program in any way.

We like to believe this column has helped to arouse the new interest in career guidance. No matter what the cause, the effect is gratifying. Again we urge you to submit detailed reports

End Mixing!
Save Time!
LSM
LOW SODIUM
with NEW
LOW SODIUM MILK
A Natural, Whole
LIQUID MILK
for restricted sodium diets
Pour LOW SODIUM MILK right from the can to patient's glass. Save time because there's no mixing. And each glass is assured the same natural consistency. LOW SODIUM MILK can be used whenever a sodium restricted diet is indicated.
Low Sodium Milk fortifies the nutritional value of any diet for it contains many of the proteins, vitamins and minerals so essential for good health and growth.
Each quart contains approximately 5% carbohydrates, 3.5% protein, 3.5% butterfat, 675 calories, AND LESS THAN 50MG. SODIUM.
Needs no refrigeration—
Can be shipped anywhere!
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How B-V adds beef flavor and nourishment to menu items for only pennies per serving

WILSON'S B-V is the most versatile product ever created to help solve the many cost and flavor problems existing in the food service business. To our many users B-V is many things. It is the means of getting rich brown gravy time after time with or *without* meat juices, making ordinary items like hamburger, stew and meat loaf into a special tasty delight. And for a quick, energy builder, nothing compares with B-V "beef tea."

Wilson's B-V springs from long-cooked, lean, red beef—much more flavorful than stock prepared from bones. Added to this beef extract we have blended specially selected vegetable proteins. These complement each other in taste . . . and provide healthful protein.

See for yourself how B-V places at your finger tips all the advantages of a long simmering stock pot. Try B-V soon. Contact your local Wilson & Co. representative.

B-V is fat-free, high in protein and low in carbohydrates. It is helpful in reducing diets. Wilson's B-V is a flavorful, nutritious, energy-giving food.

Send for free large quantity recipes. Write:

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as events occur, in order to provide us with current material.

Alabama. Over two hundred students in the Tuskegee School of Home Economics and Food Administration attended a recruiting program for careers in dietetics. What made this meeting unique was the number of men in the audience, a fact which was well handled by the speakers, Joyce McKay and Lt. Earlene Mathis, who marshalled their facts and geared their talks to fit the needs and interests of the mixed group.

Georgia. One thousand pieces of literature have been provided in answer to requests throughout the state. Plans are under way to participate in career days at the University of Georgia, Berry College, and Georgia State College for Women. Representatives of the Association are active in the following allied groups involving career guidance: Georgia Paramedical Council, Georgia Health Education Forum, and Allied Medical Careers Clubs, Inc. The latter charters allied medical career clubs in high schools throughout the state and will hold a state convention of these clubs in Atlanta in March.

Efforts of past years seem to be reaping a reward. This fall, at the University of Georgia, nine freshmen selected foods and nutrition as their major, when usually they make no decision before the junior year.

Maine. In Presque Isle, the Maine Association is participating in March in a TV series on health careers presented by the guidance directors of the various schools in the area. Home economics, including the field of dietetics, will have two of the programs on March 16 and 23. The first will be an introduction to the professions with showing of recruiting films, including *View from the Mountain.* The following week, a panel of teachers and dietitians will answer questions.

Massachusetts. A planned program of contacts is paying off.

(a) Every high school guidance director received a letter offering the film, *View from the Mountain.* So far, twenty-three requests for bookings have been received. This represents an estimated 1800 students and fills all but seven weeks of the 1960-61 school calendar.

(b) A letter to each member of the state association asking her to serve the cause of career guidance has resulted in thirty-five responses, representing every county in the state. This indicates that there is an interest in assisting career guidance where there is organized planning. From this nucleus, a permanent career guidance referral file has been developed with the hope that more names will be added later.

(c) Several members of the Massachusetts Dietetic Association will participate in a guidance program sponsored in April by Northeastern University for sixty-six schools in the Boston area. As thirty-three schools have chosen home ecomonics as one of the subjects to be presented, it is felt this is a project which might well be continued year after year.

(d) Availability of material has been made known to libraries throughout the state, to the state organization of 4-H Clubs, to the state president of the Women's Auxiliary of the Medical Association and each of her eighteen district career chairmen. As the budget permits, copies of *Dietetics as a Profession* are being furnished to each of the above. It is anticipated that valuable group and individual contacts will result from this wide coverage of potential sources for recruitment.

Michigan. The Home Economics Departments of Michigan State University and Western Michigan College have asked the Michigan Dietetic Association to suggest hospitals in the state to which students interested in dietetics, and to-be-interested, could apply for summer work. The hospitals suggested will be those where students will have a real chance to learn the responsibilities of a dietitian and an opportunity for appropriate professional experience under qualified supervision.

Material was sent to the Publica-

Who makes the finest soup for quantity food service?

Campbell does...and here's why:

We make soup the way you would if you had all the time and help you wanted. In our spotless kitchens some of the hardest-to-please chefs in the food business work with ingredients that are screened and rescreened for perfection. Then, after hours of preparation and careful simmering, Campbell's Soup has a superb home-style taste only a soup specialist can create.

Everybody—patients and staff alike—will eat good home-style soup. So start serving Campbell's Soups—prepared as directed on the label, or personalized by the addition of simple garnishes or by mixing soup with unusual ingredients. There are twenty delicious Campbell's Soups you can serve for maximum patient satisfaction with minimum preparation and cost—just open, add water or milk, and heat. That's it!

Free! For your free copy of: 1. "Nutritive Composition of Campbell Soup Company Products," 2. Recipes for quantity food service, contact your Campbell representative, or write us: Campbell Soup Company, Institutional Division, Camden 1, N. J.

How fresh Sunkist lemons can help overcome

the palatability problem in restricted diets

The relative unpalatability of special diets often leads to dissatisfaction and even "cheating." The juice of fresh Sunkist lemons has been found most useful in improving the palatability of these 3 common regimens:

1. ***Weight Reduction Diets***—Many dieters find that a dash of fresh Sunkist lemon juice makes a tasty substitute for fattening sauces and dressings. Only 4 measly calories per tablespoonful.

2. ***Low Sodium Diets***—A squeeze of fresh Sunkist lemon compensates for the lack of salt and livens up the flavor of meats, fish, vegetables, etc. Virtually free of sodium, Sunkist lemons have a generous supply of potassium.

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Sunkist *fresh lemons*

Special Offer!

"The Low Sodium, Fat-Controlled Cookbook—Special Sunkist Edition," by Alma Smith Payne, and Dorothy Callahan, former research dietitian, Massachusetts General Hospital, with introduction by Francis L. Chamberlain, M.D., M.Sc.D. Valuable guide for low-sodium patients. 480 pages, hundreds of recipes. Available from Sunkist at special price of only $1.50 (regular edition $4.00).

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Please send me postpaid____copies of *The Low Sodium, Fat-Controlled* Cookbook.
I enclose a check or money order for $____(send $1.50 for each copy ordered).

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Give Him a "LIFT" on the Road to Recovery

His diet is high in nutritive measure,
Though often low in mealtime pleasure.

But food takes on new, inviting appeal
When beautiful china "frames" the meal.

To give him a "lift," a good appetite,
Serve on this china, in every way right . . .

SYRACUSE China

High in therapeutic and utility value, Syracuse is every-way right with beautiful patterns and shapes to enhance the appeal of the blandest fare and speed patient recovery by providing a mealtime lift. And Syracuse's protective glaze assures sanitary china, resistant to chipping, scratching or absorption.

Sanitary, salutary and strong, Syracuse will serve you and your patients efficiently and economically. For full details, see your Syracuse China dealer and the famous "Hospitality Group" of open-stock patterns, including the spacesaving Trend shape for tray service.

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SYRACUSE 4, N. Y.

tions and Exhibits Department of the Detroit Public Library for a careers display. Also, the Educational Film Department of the Library was given information on *View from the Mountain* and *Take a Good Look*, for listing in a guide of sources of non-theatrical sound films and film strips available for use in the Detroit area.

The Home Economics Federation of Greater Detroit, comprised of six member groups (Detroit Dietetic Association, Home Economists in Homemaking, Home Economists in Business, Detroit Home Economics Association, Phi Upsilon Omicron, and Detroit Public School Lunchroom Managers Association) has printed a brochure to distribute to schools and interested groups. It offers: (a) to help plan "career days, assembly programs, PTA activities, occupational planning, field trips, adult educational programs, exhibits and panel discussions"; and (b) to provide free speakers to tell groups about "dietetics, research, journalism, teaching, public relations, home management, retailing, product equipment development, advertising, public health, school lunch program, institutional administration, design"; and (c) to furnish "free pamphlets, films, and slides."

Missouri. As a combined public relations–career guidance project, *View from the Mountain* and *Take a Good Look* are being shown to the St. Louis County Council of Women's Extension Clubs and the 4-H Advisory Council. These groups are composed of both men and women and represent fifty-two organizations. Also, the president of the Missouri Dietetic Association and the state chairman of public relations and career guidance appeared on two 1-hr. radio programs in St. Louis, during which listeners telephoned questions about nutrition and dietetic careers directly to the participants.

New Mexico. Members of this state association are cooperating with the New Mexico Home Economics Association in preparing career guidance information to be mailed to school principals and/or vocational counselors for the purpose of attracting more women *and* men, to all phases of home economics. A speaker's bureau has been formed, and members are available for group meetings throughout the state.

New York. The Scholarship, Education, and Career Guidance Committees in New York State have a joint project. In January, a mailing of the following was made to all counselors in the public junior and senior high schools in the state, 3000 in all:

(a) "Directory for Planning a Career in Dietetics"—a pamphlet by the New York State Dietetic Association (see January issue of JOURNAL).

(b) *Dietetics as a Profession.*

(c) A letter to the counselor.

(d) Announcement of the Association's scholarship for a high school senior, together with an application blank.

The *Genesee Dietetic Association* sponsored a booth at the local Educational Seminar put on by the Food Service Executive Association. Members have also helped Girl Scouts working for their nutrition badge.

North Dakota. Nutrition "tips" are given to the editor to work up a column in the paper of St. Anthony's School, Fargo. The editor has been a patient on a reducing regimen, and the consulting dietitian did an excellent job of stimulating her interest in food and nutrition. Could this idea be promoted in other school papers throughout the country? The results could be most rewarding for a dual purpose—to recruit prospective dietitians and to better the nutrition of our teenagers.

Pennsylvania. *View from the Mountain* was shown over WJAC-TV, Johnstown, in full color (our first report of a color TV presentation). All local members were informed by postcard well in advance of the presentation and asked to pass the word along to interested people. According to the station's program director, there are 1,222,912 television sets in the telecasting range of this station, representing a sizeable potential audience.

Puerto Rico. Our "hands across the waves" affiliated association reports a remarkable situation. They have no need for a career guidance committee as such, since interested candidates for careers in dietetics search them out! They do, however, experience difficulty in finding positions in Puerto Rico for their A.D.A. accredited graduates, a real switch!

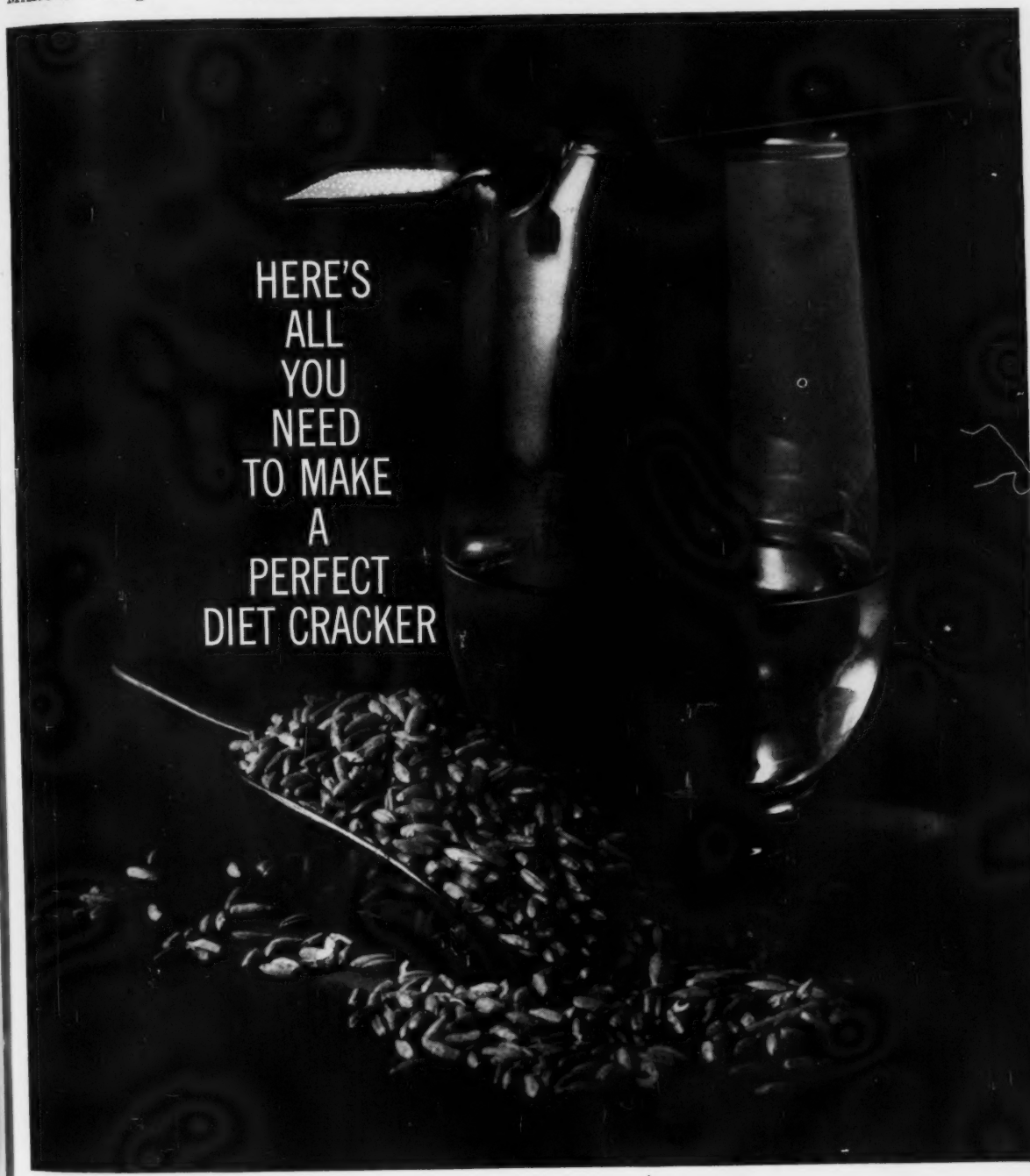
Rhode Island. "Careers in Dietetics" was aired over radio station WPRO, Providence, at a choice time, Sunday, at 8 p.m. As one of a series of programs on "Youth Looks to the Future," this was an unrehearsed half-hour session with a specialist in the field answering questions of four high school seniors. It resulted in many requests for additional information.

Public Relations in the States

Colorado. As a public relations tool, *The Prospector*, the state bulletin, is mailed to all high schools and colleges in the state that have home economics departments.

Florida. One of the goals for the year of Florida's Chairman of Public Relations is to promote the proper spelling of "dietitian."

Georgia. The Chairman of Public Relations reports that a monthly newsletter, "Jots 'N Dots," edited by the Public Relations Committee, has done a great deal in bringing the members closer by helping them know



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more about each other. As a result, they are making more effort to serve on committees, attend meetings, and participate in the activities. Copies are sent to all members, former Georgia members now in other states, retired members, dietetic interns from the state, college professors in the field of foods and nutrition or home economics, and representatives of allied associations. Copies are also sent to leaders in the Georgia Home Economics Association, utility companies, school lunch, state homemaking education, newspaper foods and women's editors, and local colleges. The newsletters contain excerpts from trade magazines, nutrition notes, information on various members, recipes, short articles, announcements and reminders of meetings, and articles on continuing education. The newsletter is published in the months when the state bulletin is not distributed.

Massachusetts. The Joint Committee of the Massachusetts League for Nursing and the Massachusetts Dietetic Association sponsored an educational program during the 1960 fall nursing convention. The Massachusetts Dietetic Association also sponsored a two-day communication workshop at the University of Massachusetts.

Michigan. For her fine promotion of dietetics in 1960, Kay Kopera, household editor of the Detroit *News*, was presented with an honorary membership in the *Detroit Dietetic Association* in December. This is the first time the Detroit Association has extended such an honor.

New Mexico. The Public Relations Committee reports one major project for the past eight months. An exhibit prepared jointly with the Dairy Council of Northern New Mexico on "Food Fallacies vs. Facts" has been used for statewide meetings of eleven allied professional and educational organizations.

North Dakota. Dorothy Revell reports that the dietetic profession is becoming more widely known in North Dakota as the result of volunteer services by dietitians. On request, help with diets and the preparation of diet manuals has been given to hospitals without dietitians.

Ohio. The Ohio Dietetic and Hospital Associations have established a joint committee to achieve a better understanding of the role of the shared or part-time dietitian serving as the only dietitian on a small hospital staff.

Association Activities

State Meetings. Association representatives attending and participating in spring meetings of state dietetic association are:

February 17–18—Edith Jones, *South Carolina*, Clemson
March 16–17—Nelda Ross Larsson, *Kentucky*, Louisville
April 7–8—Evelyn Carpenter, *Pennsylvania*, University Park
April 7–8—Doris Johnson, Ph.D., *Wisconsin*, Milwaukee
April 13–14—Adelia M. Beeuwkes, *Illinois*, Chicago
April 18–19—Grace Shugart, *Indiana*, Indianapolis
April 18–20—F. Eugenia Whitehead, D.Sc., *Oklahoma*, Oklahoma City
April 19–21—Adelia M. Beeuwkes, *New York*, New York City
April 26–29—Gertrude Miller, *Texas*, Dallas
April 27–28 — Miriam Lowenberg, Ph.D., *Virginia*, Virginia Beach
April 28–29—Evelyn Carpenter, *Alabama*, Montgomery

American National Red Cross. Edith Jones, National Institutes of Health, was our official representative in Washington, D. C., on February 1 at the luncheon sponsored by the American National Red Cross for representatives of national women's organizations. This is the first meeting to be called in peace time by the Red Cross for organized women's groups.

New A.D.A. Publications. Four handsome and tastefully designed new leaflets which reflect activities of the Association have been issued since the beginning of October.

The most comprehensive of these is *About The American Dietetic Association*, a twenty-four-page pamphlet which describes the educational background of our members, current activities, cooperation with other organizations, and the government of the Association. This effectively illlustrated pamphlet is priced at 10 cents per copy; $2.25 in lots of 25.

A promotional leaflet concerning the slidefilm, *Take a Good Look*, which was introduced at the Annual Banquet in Cleveland, was developed for the use by members, counselors, state and local dietetic associations. The leaflet contains pertinent information about the slidefilm, including the regional offices of the distributing company and the price of a print and accompanying recording. In lots under 100, the price of this leaflet is 2½ cents a copy.

Freshly illustrated, re-designed and strengthened, is the sixteen-page *A Dietetic Internship*, which contains a description of the three types of internships and provides answers to questions about this educational experience most frequently asked by students. This leaflet which carries a December revision date, is priced at 5 cents each, 25 copies for 75 cents.

Fresh off the press in January, *Dietitians in Demand*, the Association's most popular career guidance leaflet, is rewritten, generously illustrated, and filled with useful information. Single copy, 5 cents; in lots of 100, $3.

BUT DOCTOR, WHY DO I NEED MORE CALCIUM NOW?

The time to prepare for the physiological demands of motherhood is in the formative adolescent years.

Nowadays, the trend to earlier marriages makes it even more desirable that full calcification of the skeleton be achieved at an early age. Complete calcification of the bones by this age requires an average retention of about 400 mg. of calcium daily during most of adolescence. For girls 13 to 19 years old a calcium intake of 1.4 grams per day is recommended . . . along with 400 I.U. of vitamin D. Only with a liberal consumption of milk and milk products . . . at least the equivalent of 4 glasses daily . . . is calcium retention likely to reach this objective.

The expectant mother should receive extra calcium during the second half of pregnancy . . . or earlier if her dietary history is poor. An allowance of 1.5 grams daily is recommended . . . to be followed by a further increase to 2.0 grams during lactation. As three-fourths of the calcium in the national food supply comes from milk and milk products . . . low consumption of these foods usually reduces the calcium below recommended allowances. If weight control is a problem and certain food restrictions are recommended, proper food selection must be further emphasized . . . to insure adequate calcium intake, *plus* adequate protein, vitamin and other nutrient consumption. Milk products . . . of a wide variety . . . can be utilized with ease in weight control programs.

Milk and other dairy foods stand alone in their ability to provide the calcium needed by the pregnant and lactating mother in a form that is highly palatable, easily digested, and readily absorbed . . . and they also provide other nutrients which contribute to a balanced dietary and buoyant health.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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AVAILABLE ON REQUEST:
Reprints of this series of messages on Calcium
NEW CALORIE-RESTRICTED DIET SHEETS

A.D.A. Visual Aids. "Career Choices in Dietetics," a series of Kodachrome slides has been developed from selected scenes of the slidefilm, *Take a Good Look.* Eighty-four slides comprise a set which may be borrowed or purchased through the A.D.A. office. The glass–metal mounted set is priced at $44; the cardboard–mounted set, at $17; and, 44 pictures without captions, cardboard–mounted, at $10.

The 16-min., color slidefilm, itself—*Take a Good Look*—with a recorded narration, which stresses many areas of dietetics and offers considerable information about the profession, may be purchased for $15 by members through the A.D.A. office or by nonmembers through a regional office of Association Films, Inc. Loan prints are circulated by the same company.

Appointments. Icie Macy Hoobler, D.Sc., Chairman of A.D.A. representatives to the White House Conference on Children and Youth last year, will serve as the Association's representative to the newly organized *Council of National Organizations on Children and Youth.* This Council has been formed to implement the recommendations of the White House Conference.

Hazel Parry, Acting Educational Director, Department of Dietetics and Nutrition, University of Kansas Medical Center, has been appointed to a three-year term on the Association's *Membership Committee* beginning February 1961.

Margaret L. Ross, Ph.D., will serve as the new member of the *Hospital Internship Committee* of the Dietetic Internship Board.

Ann Reimer will represent the Association on the Industry Committee of the Industrial Liaison Panel, *Food Protection Committee* of the National Research Council.

American Association for Advancement of Science. Hazel M. Hauck, Ph.D., the Association's representative to the Council of the American Association for the Advancement of Science attended two meetings of that body December 27 and 30 in New York City. Proposed changes in the constitution and by-laws were approved. Some discussion was directed toward affiliated societies encouraging their own members to become members of the AAAS. In connection with this, the Executive Board of A.D.A. had previously approved a mailing to the membership inviting our members to become members of AAAS.

Affiliated societies were encouraged to consider assuming the responsibility for interdisciplinary meetings held in connection with the annual meeting of AAAS.

White House Conference on Aging. Nelda Ross Larsson and Corinne H. Robinson were the A.D.A. official representatives to the White House Conference on Aging held January 9 to 11, in Washington, D. C. Their reports concerning the conference will appear in a later issue of the JOURNAL.

The representatives were invited to attend both a pre-conference and a post-conference concerned with the White House Conference on Aging planned by the American Home Economics Association. The pre-conference meeting was held to orient representatives from all areas of home economics. At the post-conference, a panel made up of individuals from various areas of specialization in home economics commented on the information presented at the White House Conference of interest to individuals in their area of interest. They also made suggestions for implementing the recommendations of the Conference.

Obituary

Alice Heiser Fernandez. The Association has been notified of the recent death of Alice Heiser Fernandez, a member of twenty years' standing. Mrs. Fernandez had formerly been on the staff of Manhattan, Eye, Ear and Throat Hospital. Although a homemaker, she had been active in the field as Director of Gnome Bakers, Inc., of New York City, of which her husband is President.

Jane Elizabeth Wingrove Kimes. Word has been received of the death

History of The American Dietetic Association

1917-1959

Mary I. Barber, Editor

This is the first official history of the ADA from its inception in 1917 through 1959. More than being merely a record of the Association, its origin, structure, aims and accomplishments, this new book includes the many personalities that represent its leadership and explores the role of the dietitian from ancient times to the Space Age.

Chapter 1 considers the term "dietitian" historically, and presents a definition which describes the dietitian's responsibilities today. Chapter 2 outlines the history of dietetics from the ancient Ebers papyrus to the present, highlighting the achievements of great figures in the history of nutrition.

Chapter 3 gives an interesting account of the founding of the ADA. Chapters 4 through 7 record by decades the spectacular advances both of the ADA and of the science in general. Chapters 8 through 14 describe the structure of the Association, and the work of the various Committees and Sections devoted to education, community nutrition, diet therapy, etc.

Chapters 15 through 19 cover the history of dietitians in military and government service, the United States Children's Bureau and the role of the Journal of the ADA and the Association's Public Relations Department. Chapter 20 relates the challenging aspects of dietetics in the Space Age.

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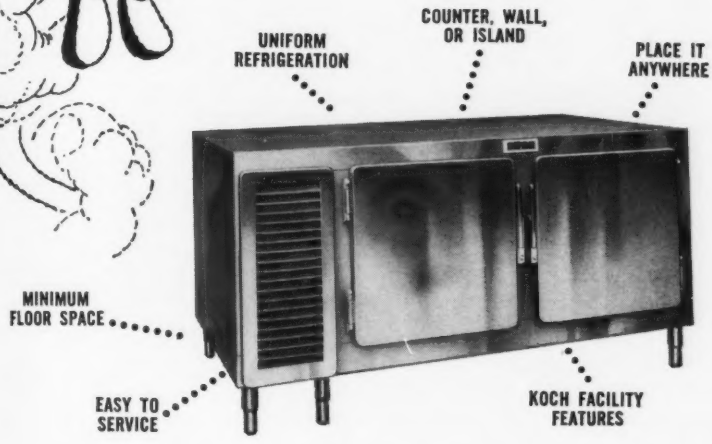

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KOCH Under Counter is designed for use where you need it

Refrigeration space is at such a premium and where can you find more when you need it? Did you ever look under your present counters and work tables? A Koch Under Counter cabinet can utilize that space to meet your increased requirements.

- **Where refrigeration is needed and there just isn't space for it.**
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- **For refrigeration in tight spots such as corners, against walls, and in low ceiling areas.**
- **At work stations, where at-hand refrigeration is a valuable saver of both time and labor.**

There is a Koch Under Counter cabinet—a size and style—to suit most uses—including hot food storage. All models may be equipped with exclusive Koch Facility Features to handle all the standard trays and pans used in your busy kitchen.

For complete utility install a stainless steel or other table top for continued use of the work space in addition to the refrigerated storage space you've added.

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Impossible? Here are the facts: One Type E Thermotainer easily stores eighteen 12″ x 20″ x 2″ pans of various prepared food and holds them in perfect serving condition for hours—enough food for 300 dinners. In order to serve the same number of people, you would need additional kitchen equipment. With a Type E Thermotainer, you use only the equipment you have—but you use it more efficiently—all through the day.

When you order a Type E or any other model Thermotainer, you get Thermotainer's many exclusive proven features: compartment design, channelled heat for uniform compartment temperature and humidity, NSF and CSA approved construction, shelf-type doors, thermostat control and many others. Compare them all—you'll buy Thermotainer.

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on December 6 of Mrs. Kimes. Mrs. Kimes at the time of her death was a homemaker and active in civic affairs in Seattle. She had been on the staff of St. Vincent's Hospital, New York City and taught at both the University of Nevada and the University of Washington, Seattle. Her membership in the Association dated from 1943.

News of Products and Services

Interfolded aluminum gold foil utility sheets for a luxury look are a new addition to the *Kaiser Aluminum and Chemical Corp.'s* line of pre-cut regular foil for the institutional market. Packaged to pop up automatically for easy dispensing, the foil may be used for wrapping and serving baked potatoes, covering individual casseroles, wrapping sandwiches, and other special service. The sheets are 9 by 10¾ in. and are packed 200 to the box. The distinguishing color identifies food items during cooking, storing, and holding.

A specialized selection of institutional foils has been developed by *Kaiser Aluminum,* and its uses are illustrated in a thirty-five-page booklet, "Put Foil on Your Payroll." Dispenser rolls in all wanted widths, weights, gauges, and finishes; interfolded pop-up sheets in gold and natural pebble finish; and interleaved cut foil sheets with tissue slipsheets have a practical and decorative use in preparing and serving entrées, buffet, desserts, catering, and take-out food service operations. Disposable foil eliminates clean-up and the natural and gold colors permit coding of pre-portioned servings.

Carnation Company now offers a new half-size can of "Trio Instant Idaho Mashed Potatoes." For both large and small users, it provides exact portion control for 7 qt. of medium firm or 8½ qt. of "fluffy whipped" potatoes. For greater yield, the fluffy whipped potatoes may be prepared by 60 seconds more mixing time at high speed, thus increasing the yield approximately 15 per cent—from 145 3.2-oz. servings to 165 servings using the No. 10 can, and from 65 servings to 75 servings using the smaller container. The mix is prepared by using boiling water only; no milk or butter need be added. The convenient smaller size supplements the regular No. 10 can.

A new tray support which can be quickly attached to any mixer bowl from 12- to 80-qt. size is available from *Universal Industries, Inc.* Specifically designed for use with Univex mixer attachments, it will fit those of other makes as well. A strong steel shelf mounted on a vertically adjustable, telescopic leg holds pans, trays, and other containers which receive processed foods from the meat chopper, vegetable slicer, and juice extractor. The shelf area is 13½ by 20½ in. and is available in galvanized or stainless steel.

Universal Industries, Inc., has announced a new "Mixer Accessory Stand." The compact unit provides a stand for any type and make of bench mixer and an enclosed storage cabinet for organization of all attachments. Mounted inside on the hinged door and the side of the cabinet are racks shaped and placed to hold vertically various cutting and grating plates and other light or flat mixer accessories. Beaters, choppers, heavy or bulky attachments rest upright on the floor of the cabinet. Telescopic legs adjust height from 24 to 36 in. The new stand (Model E-240-A) measures 2 ft. in width and depth and is constructed of galvanized or stainless steel; it is available with or without casters.

An institutional line of eleven new canned meat products, all inspected by USDA, is now available from *John Morrell & Co.* Included are 6½-lb. tins of beef and gravy, pork and gravy, beef with barbecue sauce, pork with barbecue sauce, corned beef hash, chili con carne with beans, ham shanks, and ham chunks. Two-lb. cans of boned chicken and turkey and 6¾-lb. tins of ox tongue, a specialty item prepared according to an old English recipe, complete the line.

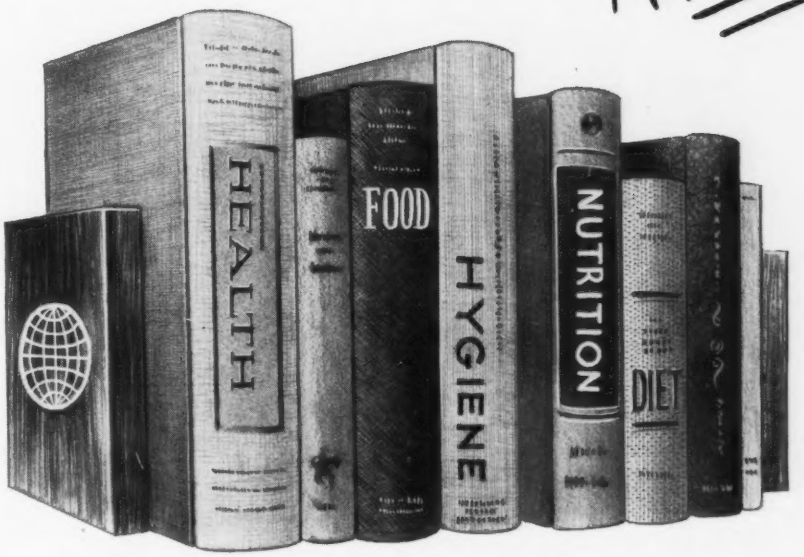
A new 20-qt. mixer from *Triumph Manufacturing Co.* features a single lever control with variable speed selection. A new frame design makes the mixer more compact and easier to clean. The power take-off for kitchen accessories is located at the side where it normally projects over the working area. No adapters are needed for smaller bowls. The unit is available in floor and bench models.

Newest item in the line of *Seco Company, Inc.* is a portable ice bin utilizing Styrofoam insulation. Made of stainless steel with a removable cover, other features of the bin are: all-coved corners, easy accessible water drain in the bottom; all four sides protected with a continuous rubber bumper; and four rubber-tired, ball-bearing swivel casters. The bin is available in 140- and 200-lb. capacities.

An illustrated brochure showing the newest designs and patterns of the *Laughlin China Company* is now available. On entering the institutional food service field, the manufacturer experimented and perfected an additive which gives ware greater resistance and long wear. The newest pattern, called "Regal," has a conventional border design.

A two-door bin is featured on the new Super Flaker SF-3 ice machine from *Scotsman Ice Machines.* In addition to the usual top access door, a front door at knee level makes it easier to reach ice in the lower half of the bin when filling containers standing on the floor or on low carts. The unit has a capacity of 1050 lb. flaked ice and a storage capacity of 350 lb.

A Report



A recent independent study made by a professional consultant found in 10 outstanding college food, nutrition, and health textbooks that, without exception, among other breakfasts, a basic cereal breakfast, mostly based on the Iowa Breakfast Studies* appeared in every textbook examined.

These studies, originated in 1948 by the College of Medicine at the State University of Iowa, demonstrated that an adequate breakfast was beneficial, whereas previously only opinion prevailed.

**A Summary of the Iowa Breakfast Studies, published by Cereal Institute, Inc., May 1, 1957.*

CEREAL INSTITUTE, INC.
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A research and educational endeavor devoted to the betterment of national nutrition

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FROZEN JUICE

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FRESH FRUIT JUICE TASTE
Plus
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★*Only* **CITRO-CREST**

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Like freshly squeezed juice.

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Like other staples, needs no freezer space.

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60 mg per 4 oz. serving.

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No thawing, no mess of squeezing, instantly ready.

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No "up and down" price changes.

Only 80¢ per gallon, Reconstituted

Convince Yourself
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WE WANT TO TAKE YOUR FREE TASTE TEST. PLEASE HAVE OUR WHOLESALE SUPPLIER SEND US FREE OF ANY CHARGE OR OBLIGATION, ONE No. 300 CAN OF EITHER OF THE FOLLOWING CITRO-CREST PRODUCTS...ENOUGH TO MAKE ONE GALLON.

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A decorated, molded, plastic handle on *Ekco Products Company's* Flint Cook and Serve Tools has been announced. The tools feature warm beige and white contour handles with a floral design in gold and umber. Fashioned from an *American Cyanamid* melamine molding compound, the pattern will not fade or wear off, having been molded into the handle itself. Tests have proved durability against abrasion and repeated washings in an automatic dishwasher. The handles are attached to the stalks with epoxy resin adhesive rather than the cutlery method of riveting. A "Holdster" or "Counter Susan" have been designed for use on counter-tops, or the tools may be hung on a board or wall.

A new chlorinated equipment cleaner, packaged in 1- and 4-oz. self-dissolving, pre-measured "Iso-Paks" to assure accurate solution strength and eliminate waste and spills, is available from *The Diversey Corporation*. The new compound, "Diomite," was developed for use wherever food products are processed or served. It provides cleaning and brightening action, effective water conditioning, and thorough rinsing.

Precision Metal Products has added a new type bussing cart to its line of mobile aluminum food service equipment. A stainless steel refuse box rides at the back of the unit between two push handles. The cart has been designed to carry three U. S. Royalite No. 3 (17 by 22 by 5 in.) dish boxes. Handles are integrally formed into the tubing of the side frames. Full swivel ball-bearing casters assure maneuverability.

Knock-down mobile refrigerator shelving racks have also been introduced by *Precision Metal Products*. Constructed of square aluminum tubing, the units have one-piece side frames. Cross supports provide a solid, rigid rack. Four shelves are removable for easy cleaning. Drip pans under shelves to collect water in mass thawing operations are optional. The racks are mounted on full-swiveling, ball-bearing casters, measure 69½ by 20 in., and are available in 41 or 57-in. lengths.

A new Unitray, providing chilling and heating in one tray, has been introduced by *Swartzbaugh Manufacturing Company*. The central chilling area is refrigerated with a chilling coil located behind the center post of the cart, assuring even temperatures throughout the area. Separated from the chilling area by molded phenolic plastic dividers are two heated areas, one on either side. Insulation of the cold area from the heated is accomplished by a pure gum rubber gasket at the bottom of the divider which forms a seal against the tray. The new cart has a twenty-tray capacity with room for a 10-oz. glass to stand upright. Length of the cart is 53¾ in.

An all-melamine sherbet dish is announced by *Plastics Manufacturing Co.* The melamine characteristic of high resistance to cold and heat delays melting. The dish may be washed in an automatic dishwasher. The sherbet dish matches the firm's dinnerware lines in colors of pastel blue, sea green, jonquil yellow, Bermuda coral, bone white, and desert tan.

Designed to provide greater frying economy and flexibility, half-kettle units called "Flex-O-Fry" are available on Model 14 Frialators from *J. C. Pitman & Sons, Inc.* They may be used as an addition to a standard kettle or as two divisions of a standard kettle, or in combinations of full and half kettles. For economy, the half-kettle may be used in off-peak periods, while all units may be used during rush periods. It is also possible to stage or dip fry, rotating fat for foods that cause a quick break down of fat. Units are obtainable in combinations tailored to the operator's needs. Each unit has its own cool zone, controls, and drain valve.

A self-contained two-shelf electric oven with the capacity of two single-deck ovens has been introduced by *Bakers Pride Oven Co., Inc.* This compact, four-pan oven is 20¼ in. high, holds up to twenty-four 10-in. pies or four 20- by 30-in. baking pans at a time. The unit has been designed for stacking up to three high, thus providing six baking shelves with a capacity of up to seventy-two 10-in. pies or twelve 20- by 30-in. baking pans. Three sets of electric heating elements provide low, medium, and high heats on separate sets of push-button controls for top, center, and bottom temperatures. A thermostat, bell timer, pilot light, and damper control are standard.

Developed cooperatively with the National Sanitation Foundation, a new equipment selection chart has been compiled and published by *Ruud Manufacturing Company*, a subsidiary of Rheem Manufacturing Company. Its studies show 40°F. to be the typical winter temperature of water in most of the U. S.; thus a water temperature rise of 140°F. is needed to provide the 180°F. necessary for the sanitizing rinse cycle of the commercial dishwasher. Originally intended as data to help Ruud wholesalers and plumbing contractors select the correct equipment for food service installation, Ruud has made the chart available to all who are interested in the operation of commercial dishwashers.

Poultry and Egg National Board announces the eighth annual National Egg Month, scheduled for March 1 to 31. The theme will be "Eggs for Go Power."

Therm Cooking Ware developed by *John Sexton & Co.*, is attractive on the table and functional in the kitchen. Double glazed and all white, outside as well as inside, with a maroon, green, or charcoal edging to harmonize with other china, the oven ware is available in a wide range of shapes and sizes for all individual service needs. The double glazing prevents crazing and discoloration and allows easier washing and sterilizing.